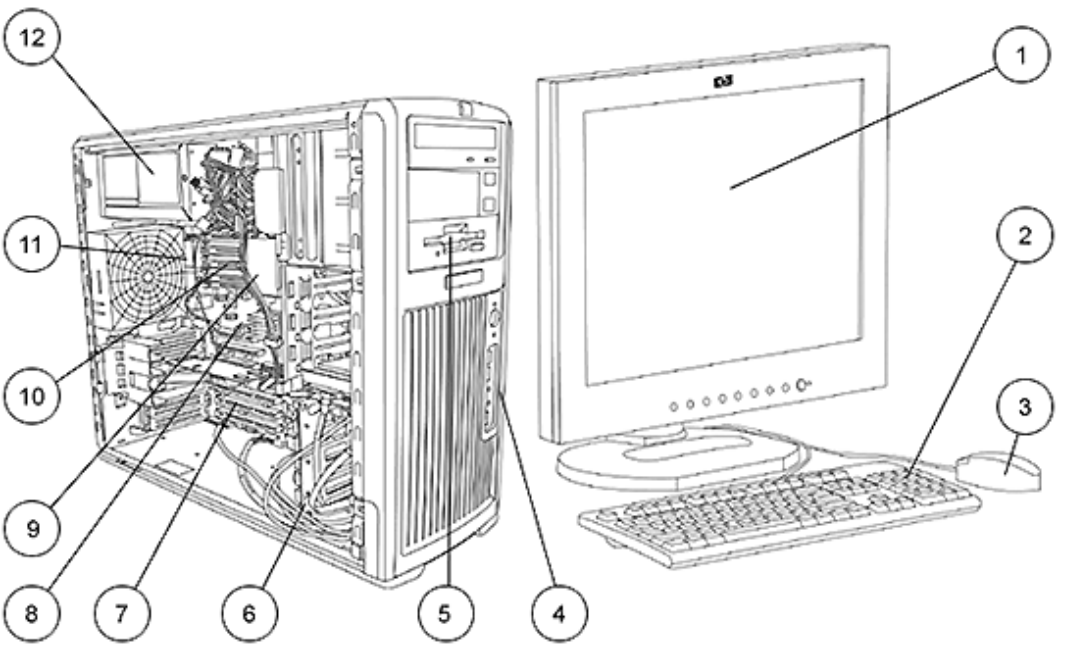
*Overview*




1. Monitor (sold separately)
2. 2004 Standard Keyboard
3. 2-Button Scroll Mouse
4. Front IO: 2 USB 2.0, IEEE-1394 (standard), headphone and microphone
5. 5.25"" external bay for optional diskette drive, optical drive or other 5.25"/3.5" device
6. 5 internal 3.5" bays, 3 external 5.25" bays
7. 2 PCI, 3 PCI-X, 1 PCI Express slots
8. 1 PCI Express x16 Graphics Bus
9. Dual 64-bit Intel® Xeon™ processors
10. 8 DIMM slots for DDR-2 memory
11. 6 USB 2.0, 1 standard serial port, 1 parallel port, 2 PS/2, 1 RJ-45, audio in/out, microphone, 1 IEEE-1394
12. 600 watt power supply

## At A Glance

- 64-bit Intel® Xeon™ processors
- Choice of operating systems:
  Microsoft Windows XP Professional
  Microsoft Windows XP Professional x64 Edition (see http://www.hp.com/workstations/pws/windowsxp64/ for details)
  Red Hat Enterprise Linux Workstation 3.0 (32- or 64-bit version)
  HP Linux Installer Kit (see http://www.hp.com/workstations/software/linux/ for details)
- Up to 16 GB of DDR-2 memory
- PCI-Express I/O and graphics
- Integrated Intel NetXtreme Gigabit ethernet
- 800 MHz processor front side bus support, depending on processor
- Intel Hyper-Threading technology support
- SATA and Ultra 320 SCSI drives
- Digital AC97 integrated audio with internal speaker
- Pre-loaded Manageability tools
- Energy Star compliance with energy-saving features
- Protected by HP Services, including a 3-3-3 standard warranty. Terms and conditions vary by country. Certain restrictions and exclusions apply.

*Standard Features - Custom Components*

| | |
|---|---|
| Processor and Speed – One of the following | Intel Xeon Processor with 800 MHz Front Side Bus<br>2.8 GHz (1 MB L2 cache)<br>3.0 GHz (1 MB L2 cache)<br>3.0 GHz (2 MB L2 cache)<br>3.2 GHz (1 MB L2 cache)<br>3.2 GHz (2 MB L2 cache)<br>3.4 GHz (1 MB L2 cache)<br>3.4 GHz (2 MB L2 cache)<br>3.6 GHz (1 MB L2 cache)<br>3.6 GHz (2 MB L2 cache)<br>2nd Intel Xeon Processor with 800 MHz Front Side Bus<br>2.8 GHz (1 MB L2 cache)<br>3.0 GHz (1 MB L2 cache)<br>3.0 GHz (2 MB L2 cache)<br>3.2 GHz (1 MB L2 cache)<br>3.2 GHz (2 MB L2 cache)<br>3.4 GHz (1 MB L2 cache)<br>3.4 GHz (2 MB L2 cache)<br>3.6 GHz (1 MB L2 cache)<br>3.6 GHz (2 MB L2 cache) |
| Operating System – One of the following | Microsoft Windows XP Professional SP1a<br>Microsoft Windows XP Professional x64 Edition<br>Red Hat Enterprise Linux Workstation 3 Update 5 (32 & 64-bit available as pre-load and as an After Market Option)<br>HP Installer CD for Red Hat Linux 7.2, 7.3 and Workstation 3 Box Set (64 bit)<br>See http://www.hp.com/workstations/software/linux/.<br>Click on "Hardware support matrix" under "Related links" for details. |
| Transition Tool Kit | HP 64-bit Xeon Transition Tool Kit |

*Standard Features - Custom Components*

| | | | |
|---|---|---|---|
| 1st Hard Disk Drive – One of the following | Serial ATA 3Gb/s Hard Drives (Currently supported only at 1.5Gb/s. To get 3Gb/s performance, a SATA 3Gb/s controller must be added - availability Fall '05) | Windows XP | Red Hat Linux |
| | 80 GB 7200 rpm Serial ATA drive (8 MB cache) | 32-Bit, 64-Bit | WS3, WS4 |
| | 160 GB 7200 rpm Serial ATA drive (8 MB cache) | 32-Bit, 64-Bit | WS3, WS4 |
| | 500 GB 7200 rpm Serial ATA drive (8 MB cache) | 32-Bit, 64-Bit | WS3, WS4 |
| | Serial ATA 1.5Gb/s Hard Drives | | |
| | 40 GB 7200 rpm Serial ATA drive (2 MB cache) | 32-Bit, 64-Bit | WS3, WS4 |
| | 80 GB 7200 rpm Serial ATA drive (8 MB cache) | 32-Bit, 64-Bit | WS3, WS4 |
| | 160 GB 7200 rpm Serial ATA drive (8 MB cache) | 32-Bit, 64-Bit | WS3, WS4 |
| | 250 GB 7200 rpm Serial ATA drive (8 MB cache) | 32-Bit, 64-Bit | WS3, WS4 |
| | 400 GB 7200 rpm Serial ATA drive (8 MB cache) | 32-Bit, 64-Bit | WS3, WS4 |
| | 74 GB 10K rpm Serial ATA drive (8 MB cache) | 32-Bit, 64-Bit | WS3, WS4 |
| | Ultra320 SCSI Hard Drives | | |
| | 73 GB 10K Ultra320 SCSI drive | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 |
| | 300 GB 10K Ultra320 SCSI drive | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 |
| | 36 GB 15K Ultra320 SCSI drive | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 |
| | 73 GB 15K Ultra320 SCSI drive | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 |
| 2nd Hard Disk Drive – One of the following | Serial ATA 3Gb/s Hard Drives | | |
| | 2nd hard drive, 80 GB 7200 rpm Serial ATA drive (8 MB cache) | 32-Bit, 64-Bit | WS3, WS4 |
| | 2nd hard drive, 160 GB 7200 rpm Serial ATA drive (8 MB cache) | 32-Bit, 64-Bit | WS3, WS4 |
| | 2nd hard drive, 500 GB 7200 rpm Serial ATA drive (8 MB cache) | 32-Bit, 64-Bit | WS3, WS4 |
| | Serial ATA 1.5Gb/s Hard Drives | | |
| | 2nd hard drive, 40 GB 7200 rpm Serial ATA drive (2 MB cache) | 32-Bit, 64-Bit | WS3, WS4 |
| | 2nd hard drive, 80 GB 7200 rpm Serial ATA drive (8 MB cache) | 32-Bit, 64-Bit | WS3, WS4 |
| | 2nd hard drive, 160 GB 7200 rpm Serial ATA drive (8 MB cache) | 32-Bit, 64-Bit | WS3, WS4 |
| | 2nd hard drive, 250 GB 7200 rpm Serial ATA drive (8 MB cache) | 32-Bit, 64-Bit | WS3, WS4 |
| | 2nd hard drive, 400 GB 7200 rpm Serial ATA drive (8 MB cache) | 32-Bit, 64-Bit | WS3, WS4 |
| | 2nd hard drive, 74 GB 10K rpm Serial ATA drive (8 MB cache) | 32-Bit, 64-Bit | WS3, WS4 |
| | Ultra320 SCSI Hard Drives | | |
| | 2nd hard drive, 73 GB 10K Ultra320 SCSI drive | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 |
| | 2nd hard drive, 146 GB 10K Ultra320 SCSI drive | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 |
| | 2nd hard drive, 300 GB 10K Ultra320 SCSI drive | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 |
| | 2nd hard drive, 36 GB 15K Ultra320 SCSI drive | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 |
| | 2nd hard drive, 73 GB 15K Ultra320 SCSI drive | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 |

| 3rd Hard Disk Drive – One of the following | | Windows XP | Red Hat Linux |
|---|---|---|---|
| | **Serial ATA 3Gb/s** | | |
| | 3rd hard drive, 80 GB 7200 rpm Serial ATA 3Gb/s drive | 32-Bit, 64-Bit | WS3, WS4 |
| | 3rd hard drive, 160 GB 7200 rpm Serial ATA 3Gb/s drive | 32-Bit, 64-Bit | WS3, WS4 |
| | 3rd hard drive, 500 GB 7200 rpm Serial ATA drive (8 MB cache) | 32-Bit, 64-Bit | WS3, WS4 |
| | **Serial ATA 1.5Gb/s Hard Drives** | | |
| | 3rd hard drive, 160 GB 7200 rpm Serial ATA drive (8 MB cache) | 32-Bit | WS3, WS4 |
| | 3rd hard drive, 400 GB 7200 rpm Serial ATA drive (8 MB cache) | 32-Bit | WS3, WS4 |
| | 3rd hard drive, 74 GB 10,000 rpm Serial ATA drive (8 MB cache) | 32-Bit | WS3, WS4 |
| | **Ultra320 SCSI Hard Drives** | | |
| | 3rd hard drive, 73 GB 10K Ultra320 SCSI drive | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 |
| | 3rd hard drive, 300 GB 10K Ultra320 SCSI drive | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 |
| | 3rd hard drive, 36 GB 15K Ultra320 SCSI drive | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 |
| | 3rd hard drive, 73 GB 15K Ultra320 SCSI drive | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 |

| 4th Hard Disk Drive – One of the following | | Windows XP | Red Hat Linux |
|---|---|---|---|
| | **Serial ATA 3Gb/s Hard Drives** | | |
| | 4th hard drive, 80 GB 7200 rpm Serial ATA 3Gb/s drive | 32-Bit, 64-Bit | WS3, WS4 |
| | 4th hard drive, 160 GB 7200 rpm Serial ATA 3Gb/s drive | 32-Bit, 64-Bit | WS3, WS4 |
| | 4th hard drive, 500 GB 7200 rpm Serial ATA drive (8 MB cache) | 32-Bit, 64-Bit | WS3, WS4 |
| | **Serial ATA 1.5Gb/s Hard Drives** | | |
| | 4th hard drive, 160 GB 7200 rpm Serial ATA drive (8 MB cache) | 32-Bit | WS3, WS4 |
| | 4th hard drive, 400 GB 7200 rpm Serial ATA drive (8 MB cache) | 32-Bit | WS3, WS4 |
| | 4th hard drive, 74 GB 10,000 rpm Serial ATA drive (8 MB cache) | 32-Bit | WS3, WS4 |
| | **Ultra320 SCSI Hard Drives** | | |
| | 4th hard drive, 73 GB 10K Ultra320 SCSI drive | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 |
| | 4th hard drive, 300 GB 10K Ultra320 SCSI drive | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 |
| | 4th hard drive, 73 GB 15K Ultra320 SCSI drive | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 |

*Standard Features - Custom Components*

| | | Windows XP | Red Hat Linux |
|---|---|---|---|
| **5th Hard Disk Drive** – One of the following | **Ultra320 SCSI Hard Drives** | | |
| | 5th hard drive, 73 GB 10K Ultra320 SCSI drive | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 |
| | 5th hard drive, 300 GB 10K Ultra320 SCSI drive | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 |
| | 5th hard drive, 73 GB 15K Ultra320 SCSI drive | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 |

| | | Windows XP | Red Hat Linux |
|---|---|---|---|
| **Factory Integrated RAID** | RAID 0 Configuration – Striped Array | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 |
| | RAID 1 Configuration – Mirrored Array | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 |
| | NOTE: Requires 2 identical hard drives (speeds, capacity, interface) | | |

| | | Windows XP | Red Hat Linux |
|---|---|---|---|
| **Drive controllers** | Integrated serial ATA controller | | |
| | Integrated dual channel Ultra320 SCSI controller with RAID (0 or 1) capability | 32-Bit | |
| | Optional Ultra 320 SCSI controller – basic | 32-Bit | 7.2, 7.3, WS3, WS4 |
| | Optional Ultra 320 SCSI controller – advanced, with RAID support and external connector | 32-Bit | |
| | Cable, 5 Part SCSI (required if 1st drive is SATA and any of the other drives are SCSI) | | |
| | Ultra320 back panel connect (uses HDCI connectors) | | |
| | Optional PCI SATA/150 Controller (SATA controller card required for 3rd and 4th SATA HDD, no SCSI drives allowed if ordered) | 32-Bit | |

*Standard Features - Custom Components*

| Memory – One of the following | | Windows XP | Red Hat Linux |
|---|---|---|---|
| | 512 MB DDR-2 PC3200 (400 MHz) ECC Registered (2 x 256 MB) | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 |
| | 1 GB DDR-2 PC2-3200 (400 MHz) ECC Registered (2 x 512 MB) | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 |
| | 2 GB DDR-2 PC2-3200 (400 MHz) ECC Registered (2 x 1 GB) | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 |
| | 2 GB DDR-2 PC2-3200 (400 MHz) ECC Registered (4 x 512 MB) | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 |
| | 3 GB DDR-2 PC2-3200 (400 MHz) ECC Registered (6 x 512 MB) | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 |
| | 3 GB DDR-2 PC2-3200 (400 MHz) ECC Registered (2 x 1GB + 2 x 512 MB) | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 |
| | 4 GB DDR-2 PC2-3200 (400 MHz) ECC Registered (8 x 512 GB) | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 |
| | 4 GB DDR-2 PC2-3200 (400 MHz) ECC Registered (4 x 1 GB) | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 |
| | 4 GB DDR-2 PC2-3200 (400 MHz) ECC Registered (2 x 2 GB) | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 |
| | 6 GB DDR-2 PC2-3200 (400 MHz) ECC Registered (6 x 1 GB) | 32-Bit, 64-Bit | 7.3, WS3, WS4 |
| | 8 GB DDR-2 PC2-3200 (400 MHz) ECC Registered (8 x 1 GB) | 64-Bit | 7.3, WS3, WS4 |
| | 16 GB DDR-2 PC2-3200 (400 MHz) ECC Registered (8 x 2 GB) | 64-Bit | WS3, WS4 |

| Removable Storage | Windows XP | Red Hat Linux |
|---|---|---|
| 1.44-MB Diskette Drive | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 |
| 48X CD-ROM Drive | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 |
| 48X/32X/48X CD-RW Drive | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 |
| 16X/40X DVD-ROM drive | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 |
| 48X/32X/48X/16X Combo CD-RW/DVD-ROM Drive | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 |
| 16X DVD+/-RW, Dual-Layer (Win and RHWS3) | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 |
| 16X DVD+/-RW, Dual-Layer, LightScribe (Windows) | 32-Bit | |

*Standard Features - Custom Components*

| 2nd Removable Storage | | Windows XP | Red Hat Linux |
|---|---|---|---|
| | 48X/32X/48X CD-RW Drive | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 |
| | 16X/40X DVD-ROM drive | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 |
| | 48X/32X/48X/16X Combo CD-RW/DVD-ROM Drive | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 |
| | 16X DVD+/-RW, Dual-Layer (Win and RHWS3) | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 |
| | 16X DVD+/-RW, Dual-Layer, LightScribe (Windows) | 32-Bit | |

| Keyboard – One of the following | | Windows XP | Red Hat Linux |
|---|---|---|---|
| | PS/2 Standard Keyboard | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 |
| | USB Standard Keyboard | 32-Bit, 64-Bit | WS3, WS4 |

| Mouse – One of the following | | Windows XP | Red Hat Linux |
|---|---|---|---|
| | PS/2 2-Button Scroll Mouse | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 |
| | PS/2 3-Button Mouse | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 |
| | USB 2-Button Optical Scroll Mouse | 32-Bit, 64-Bit | |
| | USB 3-Button Optical Mouse | 32-Bit, 64-Bit | WS3, WS4 |

| Audio | | Windows XP | Red Hat Linux |
|---|---|---|---|
| | Integrated Digital AC97 audio with internal speaker | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 |
| | Sound Blaster Audigy 2 ZS PCI | 32-Bit | |

| NIC | | Windows XP | Red Hat Linux |
|---|---|---|---|
| | Integrated Intel Pro MT 10/100/1000 LAN | 32-Bit | 7.2, 7.3, WS3, WS4 |
| | Broadcom BCM5751 NetXtreme™ Gigabit Ethernet Controller (PCI-E) | 32-Bit | |

*Standard Features - Custom Components*

| Graphics | | Windows XP | Red Hat Linux |
|---|---|---|---|
| | NVIDIA Quadro NVS 280 PCI Express (64 MB, VGA & DVI) | 32-Bit | 7.2, 7.3, WS3, WS4 |
| | NVIDIA Quadro FX 330 PCI Express (64 MB) | 32-Bit | 7.2, 7.3, WS3, WS4 |
| | ATI FireGL V3100 PCI Express (128 MB) | 32-Bit | |
| | NVIDIA Quadro FX 540 PCI Express (128 MB) | 32-Bit | 7.2, 7.3, WS3, WS4 |
| | NVIDIA Quadro FX 1400 PCI Express (128 MB) | 32-Bit | 7.2, 7.3, WS3, WS4 |
| | ATI FireGL V5100 PCI-Express (128 MB) | 32-Bit | |
| | NVIDIA Quadro FX 3400 PCI Express (256 MB) | 32-Bit | 7.2, 7.3, WS3, WS4 |
| | NVIDIA Quadro FX 3450 PCI Express (256 MB) | 32-Bit | 7.2, 7.3, WS3, WS4 |
| | NVIDIA Quadro FX 4500 PCI Express (512 MB) | 32-Bit | 7.2, 7.3, WS3, WS4 |

| Miscellaneous | |
|---|---|
| | Hood intrusion sensor |
| | Trusted Platform Module |

| Software | | Windows XP | Red Hat Linux |
|---|---|---|---|
| | Symantec Norton AntiVirus 2004 (optional)* | 32-Bit | |
| | HP Performance Tuning Framework* | 32-Bit | |
| | Altiris Recovery* | 32-Bit | |
| | HP Client Manager Software v6.0* | 32-Bit | |
| | CA® (Computer Associates) eTrust™ 64-bit Antivirus Software | 32-Bit, 64-Bit | |
| | *Not available with a Linux Operating System | 32-Bit | |

*Standard Features - Specs*

| | | |
|---|---|---|
| Operating System (choice) | Microsoft Windows XP Professional SP1a | |
| | Microsoft Windows XP Professional x64 Edition | |
| | OR Red Hat Enterprise Linux Workstation 3 Update 5 (32- or 64-bit version) | |
| | OR HP Installer Kit for Linux (includes drivers for both 32-bit & 64-bit OS versions on HP xw9300, xw8200, xw6200 and xw4200 Workstations) | |
| Form factor | Minitower | |
| Color | Carbonite/Alloy metallic | |
| System Board Form Factor | E- ATX (12" x 13") | |
| Processor | Single or dual 64-bit Intel Xeon processors (Nocona) with Hyper-Threading Technology | |
| CPU Bus Speed Supported | 800 MHz FSB | |
| Standard L2 Cache | 1 MB L2 cache (non ECC) or 2 MB L2 cache | |
| Chipset | Intel Tumwater | |
| Memory Expansion Slots | 8 DIMMs | |
| Memory Type Supported | DDR-2 (ECC registered) | |
| Memory Speed Supported | DDR-2 Synch DRAM PC2-3200 (400 MHz) Registered ECC | |
| Maximum Memory | 8 GB (8 DIMMs slots with 1 GB DIMMS) | |
| Network controller | Integrated Intel Pro MT 10/100/1000 LAN | |
| Audio | Integrated AC'97 digital audio with S/PDIF 6-channel pass-through, stereo microphone, and Yamaha XG Lite Softsynth support | |
| PCI slots | 2 full-length PCI slots (3 full-height PCI-X slots (one 133 MHz, two 100 MHz slots)<br>1 PCI Express (x8 mechanically, x4 electrically)<br>1 PCI Express x16 graphics | |
| AGP slot | None | |
| Bays | Total Bays = 8 | |
| Internal Bays | • Five 3.5 inch bays (4 with acoustic dampening rail assemblies) | |
| External Bays | • Three 5.25 inch full length 2003 mm maximum device depth (top bay is limited to 198 mm depth when optional smart cover solenoid lock is installed. Bottom bay can be converted to an internal 3.5" 3rd Hard Drive bay using optional bracket<br>• Floppy drive bay using optional bracket | |
| Parallel Port | 1 | |
| Serial Port | 1 | |
| Front I/O | 2 USB 2.0, Headphone, Microphone, IEEE 1394 | |
| Rear I/O | 1 IEEE-1394, 6 USB 2.0, 1 standard serial port, 1 parallel port, PS/2 keyboard and mouse, 1 RJ-45 to integrated Gigabit LAN, Audio In, Audio Out, Mic In | |
| USB Keyboard | Optional | |
| USB Mouse | Optional | |
| PS/2 Keyboard | 1 | |
| PS/2 Mouse | 1 | |
| Chassis Dimensions (H x W x D) | 17.9 x 8.3 x 20.7 in (45.4 x 21.0 x 52.5 cm) | |
| System weight | Minimum config – 42 lb (19 kg)<br>Standard config – 45 lb (20 kg)<br>Maximum config – 54 lb (24 kg) | |
| Shipping weight | Standard config – 54 lb (24 kg) | |
| Temperature | Operating | 40° to 95° F (5° to 35° C) |
| | Non-operating | -40° to 140° F (-40° to 60° C) |
| Humidity | Operating | 8% to 85% |
| | Non-operating | 8% to 90% |

*Standard Features - Specs*

| | | |
|---|---|---|
| Maximum Altitude (nonpressurized) | Operating | 10,000 ft (3,000 m) |
| | Non-operating | 30,000 ft (9,100 m) |
| Power Supply | 600W wide-ranging, active Power Factor Correction | |
| Interfaces Supported | 2 SATA interface (2 serial-ATA connectors), 2 Ultra320 SCSI interface, 2 EIDE interface (2 EIDE connectors) supported for optical drives, optional multi-bay interface | |
| Hard Drive Controller (PCI) Supported | Ultra160 or Ultra320, or SATA RAID, or Ultra320 RAID | |

| Preinstalled Software |
|---|
| HP Performance Tuning Framework* |
| HP Client Manager Software v6.0* |
| Altiris Local Recovery* |
| Alert Standard Format specification* |
| CD/DVD software dependent on optical drive choices |
| * Not available on Linux |

*After-Market Options*

| Processors | 2nd 64-bit Intel Xeon™ processor with Hyper-Threading | Part Number |
|---|---|---|
| | 64-bit Intel Xeon processor at 2.8 GHz with 800 MHz FSB & 1 MB of L2 cache | DY665A |
| | 64-bit Intel Xeon processor at 3.0 GHz with 800 MHz FSB & 1 MB of L2 cache | DY666A |
| | 64-bit Intel Xeon processor at 3.0 GHz with 800 MHz FSB & 2 MB of L2 cache | PQ903A |
| | 64-bit Intel Xeon processor at 3.2 GHz with 800 MHz FSB & 1 MB of L2 cache | DY667A |
| | 64-bit Intel Xeon processor at 3.2 GHz with 800 MHz FSB & 2 MB of L2 cache | PQ904A |
| | 64-bit Intel Xeon processor at 3.4 GHz with 800 MHz FSB & 1 MB of L2 cache | DY668A |
| | 64-bit Intel Xeon processor at 3.4 GHz with 800 MHz FSB & 2 MB of L2 cache | PQ905A |
| | 64-bit Intel Xeon processor at 3.6 GHz with 800 MHz FSB & 1 MB of L2 cache | DY669A |
| | 64-bit Intel Xeon processor at 3.6 GHz with 800 MHz FSB & 2 MB of L2 cache | PQ906A |

| Graphics | Multi display solutions | PCI | PCI-Express | Windows XP | Red Hat Linux | Part Number |
|---|---|---|---|---|---|---|
| | NVIDIA Quadro NVS 280 (64 MB, VGA & DVI) | X | | 32-Bit | 7.2,7.3, WS3, WS4 | AA932A |
| | NVIDIA Quadro NVS 400 (64 MB, quad head, VGA & DVI) | X | | 32-Bit | | AA605A |
| | Quadro NVS 400 DVI cables | NA | | 32-Bit | | AA606A |
| | NVIDIA Quadro NVS 280 PCI-E (64 MB, VGA & DVI) | | X | 32-Bit | 7.2, 7.3, WS3, WS4 | DY650A |
| | DMS-59 to Dual DVI Cable for NVS cards | X | X | 32-Bit | | DL139A |
| | NVIDIA Quadro FX 330 (64 MB) | | X | 32-Bit | 7.2, 7.3, WS3, WS4 | PB332A |
| | ATI FireGL V3100 (128 MB) | | X | 32-Bit | | PE949A |
| | NVIDIA Quadro FX 540 (128 MB) | | X | 32-Bit | 7.2, 7.3, WS3, WS4 | PH791A |
| | NVIDIA Quadro FX 1400 (128 MB) | | X | 32-Bit | 7.2, 7.3, WS3, WS4 | PM979A |
| | ATI FireGL V5100 (128 MB) | | X | 32-Bit | | PB330A |
| | NVIDIA Quadro FX 3400 (256 MB) | | X | 32-Bit | 7.2, 7.3, WS3, WS4 | PB329A |
| | NVIDIA Quadro FX 3450 (256 MB) | | X | 32-Bit | 7.2, 7.3, WS3, WS4 | PY640A |
| | NVIDIA Quadro FX 4500 (512 MB) | | X | 32-Bit | 7.2, 7.3, WS3, WS4 | EA762AA |

*After-Market Options*

| Hard Drives | SATA Hard Drives<br>NOTE: Serial ATA 3Gb/s Hard Drives (Currently supported only at 1.5Gb/s. To get 3Gb/s performance, a SATA 3Gb/s controller must be added - availability Fall '05) | Windows XP | Red Hat Linux | Part Number |
|---|---|---|---|---|
| | 80 GB SATA 3Gb/s Hard Drive (7200 rpm) | 32-Bit, 64-Bit | WS3, WS4 | PY267AA |
| | 160 GB SATA 3Gb/s Hard Drive (7200 rpm) | 32-Bit, 64-Bit | WS3, WS4 | PV944A |
| | 500 GB SATA 3Gb/s Hard Drive (7200 rpm) | 32-Bit, 64-Bit | WS3, WS4 | PV943A |
| | 40 GB SATA/150 Hard Drive (7200 rpm) | 32-Bit, 64-Bit | WS3, WS4 | PB371A |
| | 80 GB SATA/150 Hard Drive (7200 rpm) | 32-Bit, 64-Bit | WS3, WS4 | DE705A |
| | 160 GB SATA/150 Hard Drive (7200 rpm) | 32-Bit, 64-Bit | WS3, WS4 | DE706A |
| | 250 GB SATA/150 Hard Drive (7200 rpm) | 32-Bit, 64-Bit | WS3, WS4 | DS702A |
| | 400 GB SATA/150 Hard Drive (7200 rpm) | 32-Bit, 64-Bit | WS3, WS4 | PM254A |
| | 74 GB SATA/150 Hard Drive (10,000 rpm) | 32-Bit, 64-Bit | WS3, WS4 | DX760A |
| | SCSI Hard Drives | | | |
| | 73 GB Ultra320 SCSI Hard Drive (10,000 rpm) | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 | AA613A |
| | 146 GB Ultra320 SCSI Hard Drive (10,000 rpm) | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 | AA614A |
| | 300 GB Ultra320 SCSI Hard Drive (10,000 rpm) | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 | DY672A |
| | 36 GB Ultra320 SCSI Hard Drive (15,000 rpm) | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 | AA616A |
| | 73 GB Ultra320 SCSI Hard Drive (15,000 rpm) | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 | AA617A |
| | 146 GB Ultra320 SCSI Hard Drive (15,000 rpm) | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 | DY671A |
| | Bracket HDD 3.5 to 5.25 | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 | AA833A |
| | Cable, 5-port SCSI 8200 | | | AA818A |
| | U320 SCSI Back Panel connector (Uses HDCI, HD68, or mini DB68 connectors) | | | AA658A |

| Controllers | | PCI | PCI-Express | Windows XP | Red Hat Linux | Part Number |
|---|---|---|---|---|---|---|
| | SCSI Controllers | | | | | |
| | U320 SCSI Controller, RAID 0,1 & ext conn | X | | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 | DZ554A |
| | Ultra320 SCSI RAID Adaptec 2120S (Windows only) | X | | 32-Bit | | AA850A |

*After-Market Options*

| Input/Output Devices | | Windows XP | Red Hat Linux | Part Number |
|---|---|---|---|---|
| | **Keyboards** | | | |
| | HP PS/2 Standard Keyboard (Carbonite/Silver) | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 | DT527A |
| | HP USB Standard Keyboard (Carbonite/Silver) | 32-Bit, 64-Bit | WS3, WS4 | DT528A |
| | Smartcard adapter for modular keyboard | 32-Bit | | DT531A |
| | **Pointing Devices** | | | |
| | HP PS/2 2-Button Scroll Mouse (Carbonite) | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 | DD440B |
| | HP USB 2-Button Optical Scroll Mouse (Carbonite/Silver) | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 | DC172B |
| | HP PS/2 3-Button Mouse | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 | AA778A |
| | HP USB Optical 3-button mouse | 32-Bit, 64-Bit | WS3, WS4 | DY651A |
| | USB Spaceball 5000 | 32-Bit, 64-Bit | | DV675A |
| | USB SpaceMouse | 32-Bit, 64-Bit | | DZ203A |

| Networking | NICs | PCI | PCI-Express | Windows XP | Red Hat Linux | Part Number |
|---|---|---|---|---|---|---|
| | Intel Pro/1000MT | X | | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 | DC193A |
| | HP Gigabit by Broadcom (BCM5782) | X | | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 | DC194A |
| | Broadcom BCM5751 NetXtreme™ Gigabit Ethernet Controller (PCI-E) | | X | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 | DZ556A |
| | Broadcom NetXtreme Gigabit Ethernet PCI-Express Adapter | | X | 32-Bit | 7.2 | EA833AA |

| Memory (DIMMs) | | Windows XP | Red Hat Linux | Part Number |
|---|---|---|---|---|
| | **400 MHz DDR-2 PC2-3200 ECC Registered DIMMs** | | | |
| | 256 MB DDR-2 PC2-3200 (400 MHz) ECC Registered | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 | DY656A |
| | 512 MB DDR-2 PC2-3200 (400 MHz) ECC Registered | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 | DY658A |
| | 1 GB DDR-2 PC2-3200 (400 MHz) ECC Registered | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 | DY655A |
| | 2 GB DDR-2 PC2-3200 (400 MHz) ECC Registered – available winter 2005 | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 | PH201A |

*After-Market Options*

**Monitors** (Supported by all Operating Systems available from HP) **TFTs**

| | |
|---|---|
| HP TFT L2335 (23-inch) | P9615W# |
| HP TFT L2035 (20.1-inch) | P9614W# |
| HP TFT L1955 (19.1-inch) | PD974A5 |
| HP TFT L1755 (17-inch) | PL777AA |

**Optical Drives**

| | Windows XP | Red Hat Linux | Part Number |
|---|---|---|---|
| **DVD-ROM Drive** | | | |
| 16X/48X DVD-ROM w/ +R read | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 | AA620B |
| **CD-ROM Drive** | | | |
| 48X Max CD-ROM Drive | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 | DC143B |
| **CD-RW Drive** | | | |
| 48X/32X/48X CD-RW Drive | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 | DE205B |
| **Combo Drive** | | | |
| 48X/32X Combo DVD-ROM/CD-RW Drive | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 | DE206B |
| **DVD+/-RW Drive** | | | |
| 16X DVD+/-RW, Dual-Layer (Win and RHWS3) | 32-Bit, 64-Bit | 7.2, 7.3, WS3, WS4 | PH205A |
| 16X DVD+/-RW, Dual-Layer, LightScribe (Windows 2K and XP only) | 32-Bit | WS4* | DZ555B |

NOTE: * LightScribe works with Windows 2K and XP only.

**Removable Storage**

| | Windows XP | Red Hat Linux | Part Number |
|---|---|---|---|
| 256 MB USB 2.0 II drive key | | WS3, WS4 | PH657A |
| 1.44 MB Internal Floppy Drive | 32-Bit | | DY670A |
| HP DAT24i Internal DDS3 tape drive | 32-Bit | | C1555D |
| HP 1.44MB Internal floppy drive | 32-Bit | | DY670A |
| HP DAT24e External DDS3 tape drive | 32-Bit | | C1556D |
| HP DAT40i Internal DDS4 tape drive | 32-Bit | | C5686B |
| HP DAT40e External DDS4 tape drive | 32-Bit | | C5687C |
| HP DAT72i Internal DAT72 tape drive | 32-Bit | | Q1522A |
| HP DAT72e External DAT72 tape drive | 32-Bit | | Q1523A |

The following Removable Drive Enclosure products are available from and supported by 3rd party:
StorCase Rhino Jr. SCSI Removable Disk Enclosure
(For NA, use: HP P/N A466719, for WW, use: vendor P/N S21A107)
StorCase Rhino Jr. SATA 1.5Gb/s Removable Disk Enclosure (For NA, use: HP P/N A466720, for WW, use: vendor P/N S21J111)

*After-Market Options*

| | | |
|---|---|---|
| **Security** | Chassis clamp lock, universal, no cable | DE817A |
| | Chassis clamp lock, universal, with cable | DE818A |
| **Brackets/Stands** | xw8200 slide rack kit IT/Broadcast | DY664A |
| | Fixed Rack Kit (IT/Broadcast) | AA640A |
| | Depth Adjustable Rails (stationary) | 332558-B21 |
| | Sliding Shelf kit | 234672-B21 |
| | Fixed shelf kit | 253449-B21 |
| **Other Devices** | IDE Cable Kit xw62/82 (2nd) | DY660A |
| | Front Card Guide and Fan Kit | DY648A |
| **Operating Systems** | Red Hat Enterprise Linux Workstation 3 Update 5 (32-bit) | EA698AA |
| | Red Hat Enterprise Linux Workstation 3 Update 5 (64-bit) | EA699AA |
| | Red Hat Enterprise Linux Workstation 4 Update 1 (32/64-bit) | EA700AA |

| Software | | Windows XP | Red Hat Linux | Part Number |
|---|---|---|---|---|
| | HP Remote Graphics V2 LTU for HP WS | 32-Bit | 7.2, 7.3, WS3, WS4 | PE672A |
| | HP Remote Graphics V3 LTU for HP WS | 32-Bit | 7.2, 7.3, WS3, WS4 | PY682AA |
| | HP Remote Graphics V2 Receiver LTU | 32-Bit | 7.2, 7.3, WS3, WS4 | PE674A |
| | HP Remote Graphics V3 Receiver LTU | 32-Bit | 7.2, 7.3, WS3, WS4 | PY684AA |
| | HP Remote Graphics V2 software media | 32-Bit | 7.2, 7.3, WS3, WS4 | PE675A |
| | HP Remote Graphics V3 software media | 32-Bit | 7.2, 7.3, WS3, WS4 | PY685AA |
| | HP Remote SW for HP 1 year Update Subscription | 32-Bit | 7.2, 7.3, WS3, WS4 | PN680A |
| | HP Remote SW Receiver 1 year Update Subscription | 32-Bit | 7.2, 7.3, WS3, WS4 | PN682A |

*Memory*

E7525 chipset

DDR-2 SDRAM ECC REGISTERED MEMORY

Memory must be added in pairs. This chart does not represent all possible memory configurations. The Intel E7525 chipset supports ECC Registered 400 MHz (PC2-3200) DDR-2 memory only.

DIMM socket 1 is the furthest from the Memory Controller Hub at the top of the board. Additional DIMM slots should be populated consecutively; socket 2, 3, 4, etc. Speed mixing of memory DIMMs is not allowed. For efficient dual-channel performance, each pair of DIMMs must be same size and same DRAM technology. If mixing single sided and double sided memory, load the double sided DIMM pairs first. ECC Registered memory must be used.

If you have unused slots within a channel, chose the sockets closest to the memory controller (e.g. Sockets 7 & 8, then 5 and 6, and so on).

MAXIMUM MEMORY

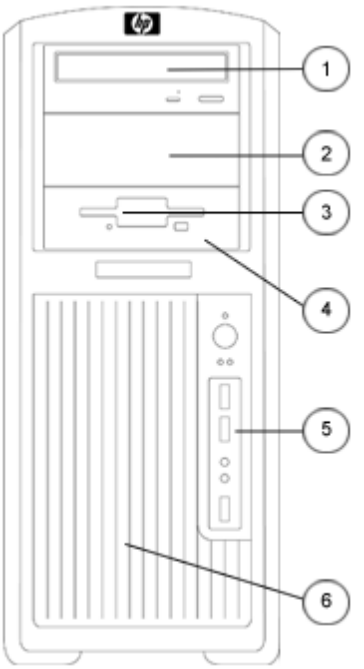
Supports up to 16 GB of DDR SDRAM.

POSSIBLE MEMORY CONFIGURATIONS

*Not all memory configurations possible are represented below.*

| DIMM Size | Slot | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 256 MB | | | | | | | | |
| 512 MB | | | | | | | | |
| 512 MB | 256 MB | 256 MB | | | | | | |
| 1 GB | | | | | | | | |
| 1 GB | 512 MB | 512 MB | | | | | | |
| 1 GB | | | | | | | | |
| 2 GB | 1 GB | 1 GB | | | | | | |
| 2 GB | 512 MB | 512 MB | 512 MB | 512 MB | | | | |
| 4 GB | 1 GB | 1 GB | 1 GB | 1 GB | | | | |
| 4 GB | 512 MB | 512 MB | 512 MB | 512 MB | 512 MB | 512 MB | 512 MB | 512 MB |
| 6 GB | 1 GB | 1 GB | 1 GB | 1 GB | 1 GB | 1 GB | | |
| 8 GB | 1 GB | 1 GB | 1 GB | 1 GB | 1 GB | 1 GB | 1 GB | 1 GB |
| 16 GB | 2 GB | 2 GB | 2 GB | 2 GB | 2 GB | 2 GB | 2 GB | 2 GB |

Tower configuration




| | Quantity Supported | Position Supported | Controller |
|---|---|---|---|
| **Convertible Minitower** | | | |
| Optional Diskette Drive | 1 | 3 | Diskette |
| 5.25" Storage Drive Bays | 3 | 1, 2, 3 | IDE |
| 3.5" Storage Drive Bays with acoustic dampening rail assemblies | 5 | 4, 5, 6, 7, 8 | SATA or SCSI |

SCSI and SATA may be mixed in a Windows configuration, only the primary drive may be SATA. SATA controller card required for 3rd and 4th SATA HDD; If SATA controller is ordered then no SCSI HDDs allowed; Linux does not support SATA controller or mixing SATA and SCSI drives.
Factory Integrated RAID*

* NOTE: Factory Integrated RAID 0 Configuration (Striped Array) and RAID 1 Configuration (Mirrored Array) requires 2 hard drives with identical speeds, capacity and interface.

| System Board | |
|---|---|
| Architecture | Xeon 64-bit/PCI-E |
| Chipset | Intel E7525/ICH5R Chipset |
| Super I/O Controller | SMSC LPC47B397 |
| System Board Form Factor | E-ATX (12" x 13") |
| Processor Socket | Dual 604 Pin ZIF |
| DIMM Connectors (DDR2, 1.8V) | 4 |
| AGP Connector (1.5V) | None |
| Integrated Graphics | None |
| PCI Connectors (5.0V) | 2 full length 33 MHz 32-bit |
| PCI-X Connectors | 2 full length 100 MHz 64-bit<br>1 full length 133 MHz 64-bit |
| PCI card guide | Optional, tool-free support for all full-length cards with PCI extender |
| Flash ROM | Yes |
| AC97 integrated audio | Yes |
| CD ROM IN (Audio) | Yes |
| AUX IN (Audio) | Yes |
| Clear CMOS Button | Yes |
| CPU Fan Header | Yes |
| Chassis Fan Header | Yes |
| Chassis Speaker Header | Yes |
| CMOS Battery Holder – Lithium | Yes |
| Hood Lock Header | None |
| Hood Sensor Header | None |
| Multibay Header | Yes |
| Hard drive acoustic dampening rails | Standard in 4 internal 3.5" bays, tool-free |
| Integrated SATA RAID | • RAID 0 and RAID 1<br>• Supports one RAID array on 2 ports<br>• Creation of 2 drive HDD array<br>• RAID 0 Configuration – Striped Array<br>• RAID 1 Configuration – Mirrored Array |
| Integrated Intel Gigabit Ethernet | Yes |
| Wake-On-Lan® | Yes |
| ASF 1.0 (Alert Standard Format) | Will be provided in a BIOS upgrade |
| Power Supply Header | Yes |
| Power Switch, Power LED & Hard Drive LED Header | Yes |
| Password Clear Header | Yes |
| Riser Connector | None |
| HDD activity LED Header | Yes |

| | |
|---|---|
| PCI extender that connects to System Board | None |

| Cooling | |
|---|---|
| Cooling Solutions Supported | Yes |
| Power Supply Fan | 92 x 25 mm |
| Processor Fan-Heatsink | 70 x 15 mm |
| Chassis Fan (front) | One 92 x 25 mm (optional) |
| Chassis Fan (rear) | One 120 mm x 28 mm (standard) |
| Internal Speaker | Standard |

| Power Supply | | | |
|---|---|---|---|
| Full Ranging Input | Yes | | |
| Active Power Factor Correction (APFC) (Input Current is nearly 1/2 a non-APFC PS) | Yes | | |
| Passive Power Factor Correction (PFC) | No | | |
| Operating Voltage Range | 90 – 264 VAC/118 VAC | | |
| Rated Voltage Range | 100 – 240 VAC | | |
| Rated Line Frequency | 50-60 Hz/400Hz | | |
| Operating Line Frequency Range | 47 – 66 Hz/393 – 407Hz | | |
| Rated Input Current | 10A/8.6A | | |
| Maximum Rated Power | 600 W | | |
| Heat Dissipation | Typical 1206.2 btu/hr<br>Maximum 2047.4 btu/hr | | |
| PS Size (wide x high x deep) | 92mm variable speed | | |
| Energy Star Compliant | Yes | | |
| Surge Tolerant Full Ranging Power Supply | Withstands power surges up to 2000V | | |
| Typical configuration power consumption | 2 processors (2x3.6GHz Xeon), 1 GB memory (2x512 MB)<br>Two hard drives (2xSATA 40 GB), DVD-ROM drive<br>PCI-Express Graphics Card (FX 1300)<br>Floppy, Monitor | | |
| | Input Power consumption | @ 120Vac/60Hz | |
| | Typical operating mode (system busy) | 353.5W | = 1206.2 btu/hr |
| | Windows XP Idle | 210.3 W | = 717.6 btu/hr |
| | Hibernate mode (S4) | 5.9 W | = 20.1 btu/hr |
| | Power Off (S5) | 5.9 W | = 20.1 btu/hr |

| ROM Features | Description |
|---|---|
| Instantly Available PC | Allows for very low power consumption with quick resume time |
| ROM Based F10 Setup and diagnostics | Review and customize BIOS settings |

| | |
|---|---|
| Remote System Installation via F12 (PXE) (Remote Boot from Server) | Allows a new or existing system to boot over the network and download software, including the operating system |
| System/Emergency ROM Flash Recovery with Video | Recovers corrupted system BIOS |
| ROM revision levels | • Identifies system ROM revision levels and reports in ROM-based F10 setup<br>Version is stored in an industry standard memory location (SMBIOS) so that management SW applications can use and report this information |
| System board revision level | • Allows management SW to read the revision level of the system board<br>Revision level is digitally encoded into the hardware and cannot be modified |
| Auto Setup when New Hardware Installed | System automatically detects addition of new hardware |
| Serial, Parallel, USB, Audio, Network, Enable/Disable Port Control | Enable or disables serial, parallel, USB, audio, and network ports |
| Removable Media Write/ Boot Control | Prevents ability to boot from removable media on supported devices (and can disable writes to media) |
| Power-On Password | Prevents an unauthorized person from booting up the computer |
| Setup Password | Prevents an unauthorized person from changing the system configuration |
| Replicated Setup | Saves BIOS settings to diskette or USB disk-on-key in human readable file. Repset.exe utility can then replicate these settings on machines being deployed without entering ROM-based F10 setup |
| Memory Change Alert (Requires HP Client Manager Software) | Alerts management console if memory is removed or changed |
| Thermal Alert (Requires HP Client Manager Software) | Monitors the temperature state within the chassis. Three modes:<br>• NORMAL – normal temperature ranges<br>• ALERTED – excessive temperatures are detected. Raises a flag so action can be taken to avoid shutdown or provide for a smoother system shutdown<br>• SHUTDOWN – excessive temperatures are encountered. Automatically shuts down the computer without warning before hardware component damage occurs |
| Master Boot Record Security | Detects changes to MBR and optional restoration, useful in protecting from viruses |
| Remote ROM Flash | Provides secure, fail-safe ROM image management from a central network console |
| Remote Wakeup/shutdown | • System administrators can power on, restart, and power off a client computer from a remote location.<br>• Enables cost-effective power consumption when the administrator needs to distribute software, perform security management, or update the ROM |
| ACPI (Advanced Configuration and Power Interface) | • Allows the system to wake from a low power mode<br>• Controls system power consumption, making it possible to place individual cards and peripherals in a low-power or powered-off state without affecting other elements of the system<br>Supports ACPI 2.0 for full compatibility with 64-bit operating systems |
| Keyboard-less Operation | The system can be operated without a keyboard |
| SMBIOS | System Management BIOS 2.3.5, previously known as DMI BIOS, for system management information |
| Localized ROM Setup | Common BIOS image supports configuration (Setup) in 11 languages, with local keyboard mappings |
| Asset tag | Allows user or MIS to set unique tag string in ROM |
| Ownership tag | Allows user or MIS to set unique tag string in ROM |
| Memory Scrubbing | Allows memory controller to transparently correct transient ECC errors in the background |
| Memory Remapping | Allows system memory lost to PCI devices to be reclaimed above 4 GB, for use with operating systems that support more than 4 GB (Windows XP 64-bit edition, Linux) |

| | |
|---|---|
| Per-slot control | Allows individual slot configuration (option ROM., latency) |
| Adaptive cooling | Fan control parameters are set according to detected hardware configuration for optimal acoustics |
| Pre-boot diagnostics | Early (pre-video) critical errors are reported via beeps and blinks on the power LED |

| Other deployment & management features | |
|---|---|
| HP Client Management Solutions | HP Client Management Solutions help simplify management of Workstations and significantly reduce total ownership costs. These solutions share a common design and are highly integrated due to the extensive work between HP and its partner Altiris.<br><br>HP Client Manager Software is included free with all HP business PCs and Workstations. It enables central tracking, monitoring, and management of the hardware aspects of HP client systems:<br><br>• Get valuable hardware information such as CPU, memory, video, and security settings<br>• Monitor system health to fix problems before they occur<br>• Install drivers and BIOS updates without visiting each PC<br>• Remotely configure BIOS and security settings<br>• Automate processes to quickly resolve hardware problems<br><br>Additional Altiris solutions (fee-based) are available to address Workstation management challenges through the entire IT lifecycle including:<br><br>• Inventory assessment<br>• Software license compliance<br>• Personality migration<br>• Software image deployment<br>• Software distribution<br>• Asset management<br>• Client backup and recovery<br>• Problem resolution<br>Visit http://www.hp.com/go/easydeploy for more information, to download HP Client Manager Software, and to evaluate the Altiris solutions. |
| System Software Manager (free) | A free utility that detects and updates BIOS, device drivers, and management agent versions on your networked PCs and workstations |
| Altiris Local Recovery | Provides data and system file protection for HP business PCs to enable fast recovery of information that is accidentally deleted or if the system becomes corrupted. Designed for disconnected or seldom-connected users, Local Recovery protects your HP computer's data and system state by taking scheduled snapshots, which are then stored in a protected area on the local hard disk. System backup and disaster recovery is now simple and fast for all users, regardless of connectivity |
| Replicated Setup | Saves BIOS settings to diskette or USB disk-on-key in human readable file. Repset.exe utility can then replicate these settings on machines being deployed without entering ROM-based F10 setup |
| Software Restore CD | Restores computer to its original factory shipping image |
| Asset Tag | • Repository for storing company-specific property asset numbers for easy tracking<br>• Initially set equal to the system serial number<br>• Stored in a protected section of non-volatile memory that can be accessed and modified with the F10 Setup program |
| DIMM Serial Presence Detect | Detects whether or not memory DIMMs are present and their type |
| Hard drive serial number, model, and manufacturer | Hard drive manufacturer, model, and serial number is stored in the hard drive firmware and reported in ROM-based F10 setup |

| | |
|---|---|
| Memory Change Alert (Requires HP Client Manager Software) | Alerts management console if memory is removed or changed |
| Ownership Tag | A user-defined string stored in non-volatile memory that is displayed in the BIOS splash screen |
| Ultra ATA Integrity Monitoring (CRC Checking) | A feature of SATA and SCSI, Cyclic Redundancy Checking provides data transfer verification and proactive notification of hard drive data transmission problems with recommendations for enhancing system performance. It detects all the following errors' types:<br>• single bit errors<br>• double bit errors<br>• an odd number of errors<br>• error bursts up to 32-bits long |
| Drive Self Tests (DPS) | • Drive Protection System (Adaptec and LSI SCSI controllers do not offer DPS)<br>• A diagnostic hard drive self test. It scans critical physical components and every sector of the hard drive for physical faults and then reports any faults to the user.<br>• Running independently of the operating system, it can be accessed through the computer's setup procedure. It produces an evaluation on whether the hard drive is the source of the problem and needs to be replaced.<br><br>The system expands on the Self-Monitoring, Analysis, and Reporting Technology (SMART), a continuously running systems diagnostic that alerts the user to certain types of failures.<br>DPS Access through F10 Setup during Boot (F10 diagnostic access not available with SCSI drives) |
| SMART Technology (Self-Monitoring, Analysis and Reporting Technology) | Allows hard drives to monitor their own health and to raise flags if imminent failures were predicted<br>Predicts failures before they occur. Tracks fault prediction and failure indication parameters such as re-allocated sector count, spin retry count, calibration retry count.<br>By avoiding actual hard drive failures, SMART hard drives act as "insurance" against unplanned user downtime and potential data loss from hard drive failure.<br>SMART I – Drive Failure Prediction<br>SMART II – Off-Line Data Collection<br>SMART III – Off-Line Read Scanning with Defect Reallocation |

| Security Features | |
|---|---|
| Access panel key lock (standard) | Prevents removal of the access panel and all internal components including optical and floppy drives |
| Padlock (optional) | Prevents entire system theft and discourages access panel removal. 7mm diameter padlock loop at rear of system. |
| Kensington Cable Lock (optional) | Prevents entire system theft only. 3mm x 7mm slot at rear of system. |
| Universal chassis clamp lock (optional) | The version without a cable discourages access panel removal and prevents theft of IO devices. The version with a cable additionally prevents entire system theft and allows multiple systems to be secured with a single cable. |

| Serviceability Features of System | |
|---|---|
| Access panel | Tool-less, one-handed |
| Optical drives | Tool-less |
| Floppy drive | Tool-less |
| Hard drives | Tool-less |
| Expansion cards | Tool-less |
| Green user touch points | Yes, on tool-free internal chassis mechanisms |

| | |
|---|---|
| Color-coordinated cables and connectors | Yes |
| Memory | Tool-less, can be upgraded without removing any internal components |
| CPUs | Tool-less, can be upgraded without removing any internal components |
| Chassis fan removal | Tool-less |
| Power supply diagnostic LED | Yes, dual function: AC OK & power OK |
| Power Button | Yes, ACPI multi-function |
| Power LED | Yes, dual color LED indicates normal operation and faults. |
| Hard drive activity LED | Yes |
| Internal speaker | Yes, used for pre-boot diagnostic beep codes |
| Dual Color Power and HD LED on Front of Computer (Indicates Normal Operations and Fault Conditions) | green – normal<br>red – fault |
| System/Emergency ROM Flash Recovery with Video | Recovers corrupted system BIOS. |
| Configuration Record SW | Yes |
| Over-Temp Warning on Screen (Requires IM Agents) | Yes |
| OS CD (Restore OS CD) | Restores computer to its original factory shipping image |
| Restore CD | Restores the computer to its original factory shipping image |
| Flash ROM | Yes |
| 3.3V Aux Power LED on System PCA | Yes |
| Dual Function 5V Aux Power LED (ON)/PS_ON LED (OFF) on System PCA | Yes |
| Clear Password Jumper | Yes |
| Clear CMOS Button | Yes |
| CMOS Battery Holder for easy Replacement | Yes |
| Processor ZIF Socket for easy Upgrade | Yes |
| DIMM Connectors for easy Upgrade | Yes |
| NIC LEDs (integrated) (Green & Amber) | Used to determine NIC status |
| ASF 1.0 support (Alert Standard Format) | Industry-standard specification for network alerting in operating system-absent environments |
| Dual function front power switch | Causes a fail-safe power off when held for 4 seconds |

| | |
|---|---|
| Service and Support | On-site Warranty and Service (Note 1): This three-year, limited warranty and service offering delivers three years of on-site, next business-day (Note 2) service for parts and labor and includes free telephone support (Note 3) 24 x 7. Global coverage (Note 2) ensures that any product purchased in one country and transferred to another, non-restricted country will remain fully covered under the original warranty and service offering. |
| | NOTE 1: Terms and conditions may vary by country. Certain restrictions and exclusions apply. |
| | NOTE 2: On-site service may be provided pursuant to a service contract between HP and an authorized HP third-party provider, and is not available in certain countries. Global service response times are based on commercially reasonable best effort and may vary by country. |
| | NOTE 3: Technical telephone support applies only to HP-configured, HP and HP-qualified, third-party hardware and software. Toll-free calling and 24 x 7 support may not be available in some countries. |

| | | |
|---|---|---|
| AC97 Integrated ADI 1981B Audio | Type | Integrated |
| | AC '97 Stereo Codec | Yes |
| | FM Synthesis Support | Yes – Yamaha XG Lite |
| | OPL3 FM Synthesis Support | Yes |
| | Sound Blaster Compatibility | Yes |
| | SPDIF 6-channel pass-through | Yes |
| | Audio Jacks | Microphone-In (20-K ohm Input Impedance); rear stereo and front analog microphone ports<br>Line-In (12-K ohm Input Impedance)<br>Line-Out * (less than 800 ohms Output Impedance, expects at least a 10-K ohm load)<br>Headphone-Out (2.5 Ohms Output Impedance, expects at least a 32 ohm load) |
| | NOTE: *Internal Speaker Amplifier is for Internal Speaker only. External Speakers need to be powered externally. | |
| | Sampling | 7 kHz – 48 kHz |
| | Wavetable Syntheses (software) | Yes – GM and FM Midi Support, Direct Music and Down Loadable Soundset (4 Meg DLS Level 1 and 2 Support) |
| | 3D Positional Sound | No |
| | Digital Audio | Yes |
| | Analog Audio | Yes |
| | Number of Channels on Line-Out (mono/stereo) | Stereo (Left & Right channels) |
| | Internal Audio Speaker Power Rating | 3W |
| | Internal Speaker | Yes |
| | Hardware Equalizer for Internal Speaker | Fixed 7 Band ParametricEQ |
| | External Speaker Jack (Line-Out) | Yes |

*Technical Specifications - Communications*

| | | |
|---|---|---|
| Integrated Intel Pro/1000MT Lan-on-Motherboard | Connector | RJ-45 |
| | Controller | Intel 82540EM Gigabit Controller |
| | Memory | Integrated 96Kb frame buffer memory |
| | Data rates supported | 10/100/1000 Mbps |
| | Compliance | IEEE 802.1A, 802.1P, 802.1P, 802.1Q, 802.2, 802.3, 802.3AB and 802.3u compliant, 802.3x flow control |
| | Bus architecture | PCI 2.2 |
| | Data transfer mode | Bus-master DMA |
| | Hardware certifications | FCC, B, CE, TUV- cTUVus Mark Canada and United States, TUV- GS Mark for European Union |
| | Power requirement | 1.48 watts @ +3.3V AUX supply with 5V tolerance |
| | Boot ROM support | Yes |
| | Network transfer rate | 10BASE-T (half-duplex) 10 Mbps |
| | | 10BASE-T (full-duplex) 20 Mbps |
| | | 100BASE-TX (half-duplex) 100 Mbps |
| | | 100BASE-TX (full-duplex) 200 Mbps |
| | | 1000BASE-T, 1000 Mbps |
| | Operating system driver support | Microsoft Windows NT 4.0, Microsoft Windows 98, Microsoft Windows 2000, Microsoft Windows XP, Linux 2.2, Linux 2.4 |
| | Management capabilities | ACPI, WOL and DMI 2.0, PXE 2.0, WfM 2.0, Intel PROset II utility |

| | | | |
|---|---|---|---|
| HP Gigabit by Broadcom (BCM5782) NIC | Connector | RJ-45 | |
| | Controller | Broadcom 5782 PCI LAN Controller | |
| | Memory | Integrated 96Kb frame buffer memory | |
| | Data rates supported | 10/100/1000 Mbps | |
| | Compliance | IEEE 802.1A, 802.1P, 802.1P, 802.1Q, 802.2, 802.3, 802.3AB and 802.3u compliant, 802.3x flow control | |
| | Bus architecture | PCI 2.2 | |
| | Data path width | 32-bit, 33/66 MHz bus interface | |
| | Data transfer mode | Bus-master DMA | |
| | Hardware certifications | FCC, B, CE, TUV- cTUVus Mark Canada and United States, TUV- GS Mark for European Union | |
| | Power requirement | 1.48 watts @ +3.3V AUX supply with 5V tolerance | |
| | Boot ROM support | Yes | |
| | Network transfer rate | 10BASE-T (half-duplex) 10 Mbps | |
| | | 10BASE-T (full-duplex) 20 Mbps | |
| | | 100BASE-TX (half-duplex) 100 Mbps | |
| | | 100BASE-TX (full-duplex) 200 Mbps | |
| | | 1000BASE-T, 1000 Mbps | |
| | Environmental | Operating temperature | 32° to 131° F (0° to 55° C) |
| | | Operating humidity | 85% at 131° F (55° C) |
| | Dimensions | 4.7 x 2.0 x 0.08 in (12 x 5 x 1.9 cm) | |

| | | |
|---|---|---|
| | Operating system driver support | Microsoft Windows NT 4.0, Microsoft Windows 98, Microsoft Windows 2000, Microsoft Windows XP, Linux 2.2, Linux 2.4 |
| | Management capabilities | ACPI, WOL and DMI 2.0, PXE 2.0, WfM 2.0, Broadcom mgmt utility |
| | Alerting | ASF 1.0 |
| | Kit contents | Broadcom 5782, CD, Broadcom Gigabit Ethernet for HP, drivers, quick install guide, product warranty statement |
| Broadcom BCM5751 NetXtreme Gigabit Ethernet Controller (PCI-E) | Connector | RJ-45 |
| | Controller | Broadcom 5751 PCI-E 1.0a LAN Controller |
| | Memory | Integrated 96Kb frame buffer memory |
| | Data rates supported | 10/100/1000 Mbps |
| | Compliance | IEEE 802.3, 802.3AB and 802.3u compliant, 802.3x flow control |
| | Bus architecture | PCI-E 1.0a |
| | Data path width | X1 |
| | Data path speed | 2.5Gbit per sec per direction transfer rate |
| | Data transfer mode | Bus-master DMA |
| | Hardware certifications | FCC class B, NRTL Mark Canada and United States, C-Tick for Australia, BSMI for Taiwan, VCCI for Japan, MIC for Korea, GOST for Russia |
| | Power requirement | 3.1 watts @ +3.3V AUX supply |
| | Boot ROM support | Yes |
| | Network transfer rate | 10BASE-T (half-duplex) 10 Mbps<br>10BASE-T (full-duplex) 20 Mbps<br>100BASE-TX (half-duplex) 100 Mbps<br>100BASE-TX (full-duplex) 200 Mbps<br>1000BASE-T, 1000 Mbps |
| | Environmental | Operating temperature 32° to 131° F (0° to 55° C)<br>Operating humidity 85% at 131° F (55° C) |
| | Dimensions | 4.4 x 2.2 x 0.08 in (11.2 x 5.5 x .2 cm) |
| | Operating system driver support | Microsoft Windows 2000 and XP, Red Hat Linux 7.2, 7.3 and Red Hat Enterprise Linux 3 |
| | Management capabilities | WOL, PXE , Remote cable management |
| | Alerting | ASF 2.0 |
| | Kit contents | Broadcom 5751, CD, Broadcom NetXtreme Gigabit Ethernet PCI NIC, drivers, quick install guide, product warranty statement |

*Technical Specifications - Communications*

| | | |
|---|---|---|
| **Broadcom NetXtreme Gigabit Ethernet Adapter** (model EA833AA) | **Connector** | RJ-45 |
| | **Controller** | Broadcom 5751 PCI-E 1.0a LAN Controller |
| | **Memory** | Integrated 96Kb frame buffer memory |
| | **Data rates supported** | 10/100/1000 Mbps |
| | **Compliance** | IEEE 802.1P, 802.1Q, 802.2, 802.3, 802.3AB and 802.3u compliant, 802.3x flow control |
| | **Bus architecture** | PCI-E |
| | **Data path width** | Single channel, PCI-E |
| | **Data transfer mode** | Bus-master DMA |
| | **Hardware certifications** | FCC, B, CE, TUV- cTUVus Mark Canada and United States, TUV- GS Mark for European Union |
| | **Power requirement** | 3.1 watts @ +3.3V AUX supply with 5V tolerance |
| | **Boot ROM support** | Yes |
| | **Network transfer rate** | 10BASE-T (half-duplex) 10 Mbps<br>10BASE-T (full-duplex) 20 Mbps<br>100BASE-TX (half-duplex) 100 Mbps<br>100BASE-TX (full-duplex) 200 Mbps<br>1000BASE-T (full-duplex) 2000 Mbps |
| | **Environmental** | **Operating temperature** 32° to 131° F (0° to 55° C)<br>**Operating humidity** 85% at 131° F (55° C) |
| | **Dimensions** | 4.4 x 2.2 x 0.08 in (11.2 x 5.5 x .2 cm) |
| | **Operating system driver support** | Microsoft Windows XP,<br>Linux 2.2, Linux 2.4, and Red Hat Linux 7.2 |
| | **Management capabilities** | ACPI, WOL and DMI 2.0, PXE 2.0, WfM 2.0, Broadcom mgmt utility |
| | **Alerting** | N/A |
| | **Kit contents** | Broadcom 5751, CD, Broadcom NetXtreme Gigabit Ethernet PCI-E Adapter, drivers, quick install guide, product warranty statement |

| | | |
|---|---|---|
| **Intel Pro 1000 MT Gigabit NIC** | **Connector** | RJ-45 |
| | **Controller** | Intel 82540EM Gigabit Controller |
| | **Memory** | Integrated 96Kb frame buffer memory |
| | **Data rates supported** | 10/100/1000 Mbps |
| | **Compliance** | IEEE 802.1A, 802.1P, 802.1P, 802.1Q, 802.2, 802.3, 802.3AB and 802.3u compliant, 802.3x flow control |
| | **Bus architecture** | PCI 2.2 |
| | **Data path width** | 32-bit, 33/66 MHz bus interface |
| | **Data transfer mode** | Bus-master DMA |
| | **Hardware certifications** | FCC, B, CE, TUV- cTUVus Mark Canada and United States, TUV- GS Mark for European Union |
| | **Power requirement** | 1.48 watts @ +3.3V AUX supply with 5V tolerance |
| | **Boot ROM support** | Yes |

*Technical Specifications - Communications*

| | | |
|---|---|---|
| Network transfer rate | 10BASE-T (half-duplex) 10 Mbps<br>10BASE-T (full-duplex) 20 Mbps<br>100BASE-TX (half-duplex) 100 Mbps<br>100BASE-TX (full-duplex) 200 Mbps<br>1000BASE-T, 1000 Mbps | |
| Environmental | Operating temperature | 32° to 131° F (0° to 55° C) |
| | Operating humidity | 85% at 131° F (55° C) |
| Dimensions | 6.4 x 4.8 x 0.8 in (16.3 x 12.1 x 1.9 cm) | |
| Operating system driver support | Microsoft Windows XP Professional, Microsoft Windows XP Professional x64 Edition, Red Hat Enterprise Linux | |
| Management capabilities | ACPI, WOL and DMI 2.0, PXE 2.0, WfM 2.0, Intel PROset II utility | |
| Kit contents | The Intel Pro 1000 MT NIC, CD containing Intel PROset II NIC drivers, quick install guide, product warranty statement | |

| | | |
|---|---|---|
| LSI Logic LSI 20320 Ultra320 SCSI single channel host adapter | Bus architecture | PCI-X (backward compatible with PCI) |
| | Number of supported devices | Up to 15 SCSI devices |
| | Interface protocol | 64 bit, 133MHz PCI-X |
| | Host bus transfer rate | Up to 1MB/s |
| | SCSI data transfer rate | Up to 320MB/s per channel |
| | SCSI Bus | Wide Ultra320, Low Voltage Differential, and Ultra Wide Single-Ended |
| | Internal connector | 68-pin HD |
| | External connector | 68 pin |
| | Total connectors | 2 |
| | Plug and Play Support | No |
| | Dimensions (H x L) | 6.6 x 2.5 in (16.9 x 6.4 cm) |
| | Approvals | CE, VCCI, Canada, C-Tick, FCC class B, UL 94VO |
| | Operating system support | Microsoft Windows XP Professional<br>Windows XP Professional x64 Edition |
| | Kit contents | Controller card, driver CD, LED cables, user documentation and warranty card. |
| Adaptec SCSI RAID 2120S Card | Dimensions (H x D) | 2.5 x 6.6 in (6.4 x 16.8 cm) Low profile card |
| | RAID level | 0, 1, 10, 5, 50, JBOD |
| | Data Transfer Rate | Up to 320 MB/s |
| | Cache Memory | 64 MB (onboard) |
| | Device Support | Up to 15 SCSI devices |
| | Bus Type | 64-bit/66 MHz PCI<br>(Also support 32-bit/33 MHz PCI) |
| | Internal Connectors | One 68-pin high-density |
| | External Connectors | One 68-pin VHDCI |
| | System Requirements | Intel PC or equivalent with available PCI slot |
| | Operating Temperature | 32° to 131° F (0° to 55° C) |
| | Power Requirements | 4 amps @ +5V |
| | Operating System Support | Windows 2000 Professional, Windows XP Professional,<br>Windows XP Professional x64 Edition |
| | Other | Optimized disk utilization<br>Online RAID Level Migration<br>Online capacity expansion<br>Immediate RAID availability (background initialization)<br>S.M.A.R.T. support |
| | Kit Contents | Controller card, driver CD, LED cables, user documentation and warranty card. |

| | | | | |
|---|---|---|---|---|
| Serial ATA 3Gb/s Hard Drives | 500 GB | Capacity | 500,107,862,016 bytes | |
| | | Height | 1.0 in (2.54 cm) | |
| | | Width | Media diameter: 3.5 in (8.89 cm)<br>Physical size: 4 in (10.2 cm) | |
| | | Interface | Serial ATA (3.0 Gb/s), Native Command Queuing enabled | |
| | | Synchronous Transfer Rate (Maximum) | Up to 3 Gb/s | |
| | | Buffer | 16 MB | |
| | | Seek Time (typical reads, includes controller overhead, including settling) | Single Track | 1.3 ms |
| | | | Average | 20.0 ms |
| | | | Full-Stroke | 30 ms |
| | | Rotational Speed | 7,200 rpm | |
| | | Logical Blocks | 976,773,168 | |
| | | Operating Temperature | 41° to 131° F (5° to 55° C) | |
| | 160 GB | Capacity | 163,928,604,672 bytes | |
| | | Height | 1.0 in (2.54 cm) | |
| | | Width | Media diameter: 3.5 in (8.89 cm)<br>Physical size: 4 in (10.2 cm) | |
| | | Interface | Serial ATA (3.0 Gb/s) | |
| | | Synchronous Transfer Rate (Maximum) | Up to 3 Gb/s | |
| | | Buffer | 8 Mbytes | |
| | | Seek Time (typical reads, includes controller overhead, including settling) | Single Track | 0.9 ms |
| | | | Average | 9.3 ms |
| | | | Full-Stroke | 18 ms |
| | | Rotational Speed | 7,200 rpm | |
| | | Logical Blocks | 320,173,056 | |
| | | Operating Temperature | 41° to 131° F (5° to 55° C) | |

*Technical Specifications - Hard Drives*

| | | | |
|---|---|---|---|
| 80 GB | Capacity | 80,026,361,856 bytes | |
| | Height | 1.0 in (2.54 cm) | |
| | Width | Media diameter: 3.5 in (8.89 cm)<br>Physical size: 4 in (10.2 cm) | |
| | Interface | Serial ATA (3.0 Gb/s) | |
| | Synchronous Transfer Rate (Maximum) | Up to 3 Gb/s | |
| | Buffer | 8 MB | |
| | Seek Time (typical reads, includes controller overhead, including settling) | Single Track | 2 ms |
| | | Average | 9.3 ms |
| | | Full-Stroke | 21 ms |
| | Rotational Speed | 7,200 rpm | |
| | Logical Blocks | 156,301,488 | |
| | Operating Temperature | 41° to 131° F (5° to 55° C) | |

| | | | |
|---|---|---|---|
| Serial ATA 1.5Gb/s Hard Drives (7200 rpm) 40 GB | Capacity | 40,020,664,320 bytes | |
| | Height | 1 in (2.6 cm) | |
| | Width | Media diameter: 3.5 in (8.9.x cm)<br>Physical size: 4 in (10.2 cm) | |
| | Interface | Serial ATA | |
| | Synchronous Transfer Rate (Maximum) | 150 MB/s | |
| | Buffer | 2 MB | |
| | Seek Time (typical reads, includes controller overhead, including settling) | Single Track | 1.0 ms |
| | | Average | 8.5 ms |
| | | Full-Stroke | 18.0 ms |
| | Rotational Speed | 7,200 rpm | |
| | Logical Blocks | 78,165,360 | |
| | Operating Temperature | 32° to 140° F (0° to 60° C) | |

*Technical Specifications - Hard Drives*

| | | | |
|---|---|---|---|
| 80 GB | Capacity | 80,026,361,856 bytes | |
| | Height | 1 in (2.6 cm) | |
| | Width | Media diameter: 3.5 in (8.9.x cm)<br>Physical size: 4 in (10.2 cm) | |
| | Interface | Serial ATA | |
| | Synchronous Transfer Rate (Maximum) | 150 MB/s | |
| | Buffer | 8 MB | |
| | Seek Time (typical reads, includes controller overhead, including settling) | Single Track | 1.0 ms |
| | | Average | 8.5 ms |
| | | Full-Stroke | 18 ms |
| | Rotational Speed | 7,200 rpm | |
| | Logical Blocks | 156,301,488 | |
| | Operating Temperature | 32° to 140° F (0° to 60° C) | |
| 160 GB | Capacity | 160,041,885,696 bytes | |
| | Height | 1 in (2.6 cm) | |
| | Width | Media diameter: 3.5 in (8.9.x cm)<br>Physical size: 4 in (10.2 cm) | |
| | Interface | Serial ATA | |
| | Synchronous Transfer Rate (Maximum) | 150 MB/s | |
| | Buffer | 8 MB | |
| | Seek Time (typical reads, includes controller overhead, including settling) | Single Track | 1.0 ms |
| | | Average | 8.5 ms |
| | | Full-Stroke | 18 ms |
| | Rotational Speed | 7,200 rpm | |
| | Logical Blocks | 312,581,808 | |
| | Operating Temperature | 32° to 140° F (0° to 60° C) | |

*Technical Specifications - Hard Drives*

| | | | |
|---|---|---|---|
| 250 GB | Capacity | 250,059,350,016 bytes | |
| | Height | 1 in (2.6 cm) | |
| | Width | Media diameter: 3.5 in (8.9 cm)<br>Physical size: 4 in (10.2 cm) | |
| | Interface | Serial ATA | |
| | Synchronous Transfer Rate (Maximum) | 150 MB/s | |
| | Buffer | 8 MB | |
| | Seek Time (typical reads, includes controller overhead, including settling) | Single Track | 0.8 ms |
| | | Average | <9.0 ms |
| | | Full-Stroke | ≤17 ms |
| | Rotational Speed | 7,200 rpm | |
| | Logical Blocks | 488,397,168 | |
| | Operating Temperature | 41° to 131°F (5° to 55°C) | |
| 400 GB | Capacity | 400,088,457,216 bytes | |
| | Height | 1 in (2.6 cm) | |
| | Width | Media diameter: 3.5 in (8.9.x cm)<br>Physical size: 4 in (10.2 cm) | |
| | Interface | Serial ATA | |
| | Synchronous Transfer Rate (Maximum) | 150 MB/s | |
| | Buffer | 8 MB | |
| | Seek Time (typical reads, includes controller overhead, including settling) | Single Track | 0.8 ms |
| | | Average | <11.0 ms |
| | | Full-Stroke | ≤15 ms |
| | Rotational Speed | 7,200 rpm | |
| | Logical Blocks | 781,422,768 | |
| | Operating Temperature | 41° to 131°F (5° to 55°C) | |

*Technical Specifications - Hard Drives*

| | | | | |
|---|---|---|---|---|
| **Serial ATA 1.5Gb/s Hard Drives** (10,000 rpm) | 74 GB | **Capacity** | 74,355,769,344 bytes | |
| | | **Height** | 1.0 in (2.54 mm) | |
| | | **Width** | Media diameter: 3.3 in (84mm)<br>Physical size: 4 in (10.2 cm) | |
| | | **Interface** | Serial ATA | |
| | | **Synchronous Transfer Rate** (Maximum) | 150 MB/s | |
| | | **Buffer** | 8 MB | |
| | | **Seek Time** (typical reads, includes controller overhead, including settling) | **Single Track** | 0.3 ms |
| | | | **Average** | 4.5 ms |
| | | | **Full-Stroke** | 10.2 ms |
| | | **Rotational Speed** | 10,000 rpm | |
| | | **Logical Blocks** | 145,226,112 | |
| | | **Operating Temperature** | 41° to 140° F (5 to 60° C) | |
| **Ultra320 SCSI Hard Drives** (10,000 rpm) | 73 GB | **Capacity** | 73,407,865,856 bytes | |
| | | **Height** | 1.0 in (2.54 cm) | |
| | | **Width** | 3.5 in (8.9 cm) | |
| | | **Interface** | 68 pin LVD SCSI | |
| | | **Synchronous Transfer Rate** (Maximum) | 320 MB/s | |
| | | **Buffer** | 8 Mbytes | |
| | | **Seek Time** (typical reads, includes controller overhead, including settling) | **Single Track** | 0.3 msec |
| | | | **Average** | <4.5 msec |
| | | | **Full-Stroke** | <11.0 msec |
| | | **Rotational Speed** | 10,000 rpm | |
| | | **Logical Blocks** | 143,374,738 | |
| | | **Operating Temperature** | 40° to 130° F (5° to 55° C) | |

| | | | |
|---|---|---|---|
| 146 GB | Capacity | 146,815,737,856 bytes | |
| | Height | 1.0 in (2.54 cm) | |
| | Width | 3.5 in (8.9 cm) | |
| | Interface | 68 pin LVD SCSI | |
| | Synchronous Transfer Rate (Maximum) | 320 MB/s | |
| | Buffer | 8 Mbytes | |
| | Seek Time (typical reads, includes controller overhead, including settling) | Single Track | 0.3 msec |
| | | Average | <4.5 msec |
| | | Full-Stroke | <11.0 msec |
| | Rotational Speed | 10,000 rpm | |
| | Logical Blocks | 286,749,488 | |
| | Operating Temperature | 40° to 130° F (5° to 55° C) | |
| 300 GB | Capacity | 300,000,000,000 bytes | |
| | Height | 1.0 in (2.54 cm) | |
| | Width | 3.5 in (8.9 cm) | |
| | Interface | 68 pin LVD SCSI | |
| | Synchronous Transfer Rate (Maximum) | 320 MB/s | |
| | Buffer | 8 Mbytes | |
| | Seek Time (typical reads, includes controller overhead, including settling) | Single Track | 0.3 msec |
| | | Average | <4.5 msec |
| | | Full-Stroke | <11.0 msec |
| | Rotational Speed | 10,000 rpm | |
| | Logical Blocks | 585,937,500 | |
| | Operating Temperature | 40° to 130° F (5° to 55° C) | |

*Technical Specifications - Hard Drives*

| | | | | |
|---|---|---|---|---|
| **Ultra320 SCSI Hard Drives** (15,000 rpm) | **36 GB** | **Capacity** | 36,420,075,520 bytes | |
| | | **Height** | 1.0 in (2.54 cm) | |
| | | **Width** | 3.5 in (8.9 cm) | |
| | | **Interface** | 68 pin LVD SCSI | |
| | | **Synchronous Transfer Rate** (Maximum) | 320 MB/s | |
| | | **Buffer** | 8 Mbytes | |
| | | **Seek Time** (typical reads, includes controller overhead, including settling) | **Single Track** | 0.3 msec |
| | | | **Average** | <4.5 msec |
| | | | **Full-Stroke** | <11.0 msec |
| | | **Rotational Speed** | 15,000 rpm | |
| | | **Logical Blocks** | 71,132,960 | |
| | | **Operating Temperature** | 40° to 130°F (5° to 55°C) | |
| | **73 GB** | **Capacity** | 73,407,865,856 bytes | |
| | | **Height** | 1.0 in (2.54 cm) | |
| | | **Width** | 3.5 in (8.9 cm) | |
| | | **Interface** | 68 pin LVD SCSI | |
| | | **Synchronous Transfer Rate** (Maximum) | 320 MB/s | |
| | | **Buffer** | 8 Mbytes | |
| | | **Seek Time** (typical reads, includes controller overhead, including settling) | **Single Track** | 0.3 msec |
| | | | **Average** | <4.5 msec |
| | | | **Full-Stroke** | <11.0 msec |
| | | **Rotational Speed** | 15,000 rpm | |
| | | **Logical Blocks** | 143,374,738 | |
| | | **Operating Temperature** | 40° to 130°F (5° to 55° C) | |
| | **146 GB** | **Capacity** | 146,815,737,856 bytes | |
| | | **Height** | 1.0 in (2.5 cm) | |
| | | **Width** | 3.5 in (8.9 cm) | |
| | | **Interface** | 68 pin LVD SCSI | |
| | | **Synchronous Transfer Rate** (Maximum) | 320 MB/s | |
| | | **Buffer** | 8 Mbytes | |
| | | **Seek Time** (typical reads, includes controller overhead, including settling) | **Single Track** | 0.3 msec |
| | | | **Average** | <4.5 msec |
| | | | **Full-Stroke** | <11.0 msec |
| | | **Rotational Speed** | 15,000 rpm | |
| | | **Logical Blocks** | 143,374,738 | |
| | | **Operating Temperature** | 40° to 130°F (5° to 55°C) | |

*Technical Specifications - Removable Storage*

| | | |
|---|---|---|
| USB Disk on Key | Dimensions (HxWxD) | 0.9 x 0.7 x 3.9 in (2.3 x 1.8 x 9.8 cm) |
| | Weight | 0.05 lb (0.02 kg) |
| | USB Specification | 2.0 |
| | Transfer Rate | Read-1023 KB/Sec; Write-850 KB/Sec |
| | Storage Media | Solid state flash memory, no moving parts |
| | Power Supply | USB Bus-powered, no external power required |
| | Capacity | 256 MB |

| | | | |
|---|---|---|---|
| PS/2 OR USB '04 Standard Keyboard | Physical characteristics | Keys | 104, 105, 106, 107, 109 layout (depending upon country) |
| | | Dimensions (L x W x H) | 18.0 x 6.4 x 0.98 in (45.8 x 16.3 x 2.5 cm) |
| | | Weight | 2 lb (0.9 kg) minimum |
| | Electrical | Operating voltage | + 5VDC ± 5% |
| | | Power consumption | 50-mA maximum (with three LEDs ON) |
| | | ESD | CE level 4, 15-kV air discharge |
| | | EMI - RFI | Conforms to FCC rules for a Class B computing device |
| | | MicrosoftPC 99 - 2001 | Functionally compliant |
| | Mechanical | Languages | 38 available |
| | | Keycaps | Low-profile design |
| | | Switch actuation | 55-g nominal peak force with tactile feedback |
| | | Switch life | 20 million keystrokes (using Hasco modified tester) |
| | | Switch type | Contamination-resistant switch membrane |
| | | Key-leveling mechanisms | For all double-wide and greater-length keys |
| | | Cable length | 6 ft (1.8 m) |
| | | Microsoft PC 99 - 2001 | Mechanically compliant |
| | | Acoustics | 43-dBA maximum sound pressure level |
| | Environmental | Operating temperature | 50° to 122° F (10° to 50° C) |
| | | Non-operating temperature | -22° to 140° F (-30° to 60° C) |
| | | Operating humidity | 10% to 90% (non-condensing at ambient) |
| | | Non-operating humidity | 20% to 80% (non-condensing at ambient) |
| | | Operating shock | 40 g, six surfaces |
| | | Non-operating shock | 80 g, six surfaces |
| | | Operating vibration | 2-g peak acceleration |
| | | Non-operating vibration | 4-g peak acceleration |
| | | Drop (out of box) | 26 in (66 cm) on carpet, six-drop sequence |
| | | Drop (in box) | 42 in (107 cm) on concrete, 16-drop sequence |
| | Operating system support | Microsoft Windows XP Professional, Microsoft Windows XP Professional x64 Edition, Red Hat Enterprise Linux Workstation 3 and 4 | |
| | Approvals | UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC | |
| | Ergonomic compliance | ANSI HFS 100, ISO 9241-4, and TUVGS | |
| | Kit contents | Keyboard, keyboard software media, installation guide, warranty card, safety and comfort | |

*Technical Specifications - Input/Output Devices*

| | | | |
|---|---|---|---|
| HP PS/2 Scroll Mouse | Dimensions | 3.8 x 6.3 x 11.6 cm (1.5 x 2.5 x 4.6 in) | |
| | Weight | 4.44 oz (126 g) | |
| | Environmental | Operating temperature | 50° to 122° F (10° to 50° C) |
| | | Non-operating temperature | -22° to 140° F (-30° to 60° C) |
| | | Operating humidity | 10% to 90% (non-condensing at ambient) |
| | | Non-operating humidity | 20% to 80% (non-condensing at ambient) |
| | | Operating shock | 40 g, 6 surfaces |
| | | Non-operating shock | 80 g, 6 surfaces |
| | | Operating vibration | 2 g peak acceleration |
| | | Non-operating vibration | 4 g peak acceleration |
| | | Drop (out-of-box) | 26 in (66 cm) on carpet, 6-drop sequence |
| | | Drop (out-of-box) | 1 m on asphalt tile over concrete, 6-drop sequence |
| | Electrical | Operating voltage | 5 VDC ± 10% |
| | | Power consumption | 15 mA |
| | | System consumption | PS/2 mini-din connector |
| | | ESD | CE level 4, 15 kV air discharge |
| | | EMI-RFI | Conforms to FCC rules for a Class B computing device |
| | | Microsoft PC99 - 2001 | Functionally compliant |
| | Mechanical | Resolution | 400 ± 20% DPI |
| | | Tracking speed | 10 in/s maximum |
| | | Acceleration | 100 in/s |
| | | Switch actuation | 65 g nominal peak force |
| | | Switch life | 1,000,000 operations (using Hasco modified tester) |
| | | Switch type | Low force micro-switches |
| | | Tracking mechanism life | 155 mi (250 km) at average speed of 10 in/s |
| | | Cable length | 6 ft (1.8 m) |
| | | Microsoft PC99 - 2001 | Mechanically compliant |
| | Scroll wheel | Width | 8 mm |
| | | Diameter | 0.99 in (25.2 mm) |
| | | Maximum rotation speed | 30 mm/s |
| | | Switch type | Light force micro-switch |
| | | Switch life | 1 million operations |
| | | Mechanical life | Minimum 200,000 revolutions |
| | Regulatory approvals | Compliant | UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC |
| | Compatibility | Operating system support | Microsoft Windows XP Professional, Microsoft Windows XP Professional x64 Edition, Red Hat Enterprise Linux Workstation 3 and 4 |

*Technical Specifications - Input/Output Devices*

| | | | |
|---|---|---|---|
| HP 2-button Optical Scroll Mouse (USB) | Dimensions (H x L x W) | | 1.5 x 4.5 x 2.5 in (3.8 x 11.6 x 6.3 cm) |
| | Weight | | 0.27 lb (0.12 kg) |
| | Cable length | | 72.8 in (185 cm) |
| | System requirements | | Microsoft Windows XP Professional, Microsoft Windows XP Professional x64 Edition, Red Hat Enterprise Linux Workstation 3 and 4 |
| HP 3-Button Mouse (PS/2) | Dimensions/Weight | Height | 1.42 in (3.6 cm) |
| | | Length | 4.17 in (10.7 cm) |
| | | Width | 2.87 in (7.4 cm) |
| | | Weight | 5.20 oz (150 g) |
| | Environmental | Operating temperature | 32° to 104° F (0° to 40° C) |
| | | Non-operating temperature | -4° to 140° F (-20° to 60° C) |
| | | Operating humidity | 10% to 90% (non-condensing at ambient) |
| | Mechanical | Resolution | 400 20% DPI |
| | | Tracking speed | 10 in/s Maximum |
| | | Switch life | 1,000,000 operations (using Hasco modified tester) |
| | | Switch type | Micro-switches |
| | | Tracking mechanism life | 155 miles (250 km) at average speed of 10 in/s |
| | | Cable length | 6 ft (1.8 m) |
| | | PC98-99 | Mechanically compliant |
| Spaceball 5000 (USB) | Physical characteristics | Dimensions (H x W x D) | 3.0 x 6.0 x 8.4 in (7.6 x 15.2 x 21.3 cm) |
| | | Ball Diameter | 2.2 in (5.6 cm) |
| | | Weight | 2.1 lb (9.94 kg) |
| | | Features | Six degrees of freedom motion control through the X, Y, Z axis (pitch, roll, yaw)<br>Certified for leading CAD and DCC applications |
| | Environmental | Operating temperature | 50° to 104° F (10° to 40° C) |
| | | Non-operating temperature | 43° to 140° F (6° to 60° C) |
| | | Operating humidity | 8% to 80% (non-condensing at ambient) |
| | | Non-operating humidity | 5% to 80% (non-condensing at ambient) |
| | Mechanical | Buttons | 12 programmable (unshifted) |
| | | Ball Force Range | 0.5 - 8.2N/1.8 - 29.5 oz |
| | | Ball Torque Range | 0.085 – 0.33 oz-in. (6.91 Nmm) |
| | | Resolution | 10 bits |
| | Serial Specifications | Connector | USB 1.1 or greater |
| | | Cable Length | 12.8 ft. (3.9 m) |
| | | Data Rate | USB model – 16 msec |
| | | Flow Control | Xon/Xoff (on PS/2 model only) |
| | Software Drivers Available | USB model | Microsoft Windows XP Professional |
| | System Requirements | Disk Space | 10 MB free disk space |

| | | | |
|---|---|---|---|
| | Regulatory Approvals | | UL, cUL, EN 950, EN 60950, CSA, FCC, CE Mark, TUV, CISPR 22, EN 50082, IEC 1000 4-2, IEC 1000-4-3, AS/NZS, VCCI, BSMI, C-Tick |
| HP SpaceMouse Plus USB | Physical characteristics | Dimensions (H x W x D) | 7.4 x 4.72 x 1.73 in (18.8 x 12.0 x 4.4 cm) |
| | | Cap Diameter | 2 x 6.5 x 6.6 mm |
| | | Weight | 1.5 lb (0.68 kg) |
| | | Features | Six degrees of freedom motion control through the X, Y, Z axis (pitch, roll, yaw)<br>Certified for leading CAD and DCC applications |
| | Environmental | Operating temperature | 41° to 140° F (5° to 60° C) |
| | | Non-operating temperature | -13° to 158° F (-25° to 70° C) |
| | | Operating humidity | 10 to 98 % RH (non-condensing) |
| | | Non-operating humidity | 10 to 98 % RH (non-condensing) |
| | Mechanical | Buttons | 11 programmable (unshifted) |
| | | Cap Force Range | 0.2 N – 4.5 N |
| | | Cap Torque Range | 4 Nmm to 100 Nmm |
| | | Resolution | 8 bit |
| | USB Specifications | Connector | USB 1.1 or greater |
| | | Cable Length | 2 m |
| | | Data Rate | 16 msec |
| | Software Drivers Available | Microsoft Windows XP | |
| | System Requirements | Disk Space | 10 MB free disk space |
| | Regulatory Approvals | | UL, cUL, EN 950, EN 60950, CSA, FCC, CE Mark, TUV, CISPR 22, EN 50082, IEC 1000 4-2, IEC 1000-4-3, AS/NZS, VCCI, BSMI, C-Tick |

*Technical Specifications - Optical Devices*

| | | | |
|---|---|---|---|
| 48X CD-ROM Drive | Form Factor | 5.25-in, half-height, tray load | |
| | Mounting Orientation | Horizontal or vertical | |
| | Interface | ATAPI/EIDE | |
| | Dimensions (HxWxD) | 1.63 x 5.83 x 7.27 in (4.13 x 14.6 x 18.5 cm) | |
| | Weight | 1.76 lb (0.8 kg) | |
| | Data Transfer Rates - Read | Digital audio extraction (minimum) – 1,200 KB/s (8X)<br>CD read – up to 7,200 KB/s (48X) | |
| | Media and Formats - Read | CD Media | stamped, CD-R, CD-RW (LS, HS, US) |
| | | CD Capacities | 180 MB (mode 2, 8 cm); 540 MB (mode 1, 12 cm); 650 MB (mode 2, 12 cm); 700 MB (Mode 2, 12 cm, 80-minute) |
| | | CD Formats | CD-DA, CD-ROM (Mode 1 and 2), CD-XA (Mode 2, Form 1 and 2), Photo CD (Single and Multi-session), Mixed Mode (Audio and Data combined), CD-I (Mode 2, Form 1 and 2, and CD-I Ready), CD-Extra, CD-Bridge, Video CD |
| | Access Times (typical reads, including settling) | CD-ROM Mode 1 | < 125 ms |
| | | Full Stroke CD | < 210 ms |
| | | Start-up Time (typical) | < 7 s (single session), < 30 s (multi-session) |
| | | Stop Time (typical) | < 4 s |
| | | Write Buffer Size | 128 KB (minimum) |
| | | Data Transfer Modes | PIO Mode 4 (16.6 MB/s); Multi-word DMA mode 2 (16.6 MB/s); UltraDMA Mode 0 (16.7 MB/s); UltraDMA Mode 2 (33.3 MB/s) |
| | Power | Source | Four-pin, DC power receptacle |
| | | DC Power Requirement | 5 VDC ± 5% - 100 mV ripple p-p<br>12 VDC ± 5% - 200 mV ripple p-p |
| | | DC Current | 5 VDC - <1000 mA typical, < 1600 mA maximum<br>12 VDC - < 600 mA typical, <1400 mA maximum |
| | | Total Drive Power (standby mode) | < 2.5 Watt |
| | Audio Output | Line-Out | 0.7 VRMS |
| | | Signal-to-Noise Ratio | 74 dB |
| | | Channel Separation | 65 dB |
| | Configuration Jumper Block | Master, slave, and cable select modes | |
| | Operating Conditions (all conditions non-condensing) | Temperature | 41° to 122° F (5° to 50° C) |
| | | Humidity | 10% to 80% |
| | Certifications, Approvals | MMC-3 support, multi-read compliant, Microsoft WHQL certification, ACA AS/NZS 3548 class B, BSMI CNS 13438, CE Mark, C.I.S.P.R. Pub 22, TUV or VDE EN60950, EN 55022, EN55024, EMKO EN60950, EN 60825-1, UL 60950, CSA C22.2 60950-2000, CFR 21 part 1040 class 1, CFR 47 C.I.S.P.R. Pub 22 Class B, DHHS/FDA, ANSI C63.4-1992 (FCC Class B) | |

| | | | |
|---|---|---|---|
| | Operating Systems Supported | | Microsoft Windows XP Professional, Microsoft Windows XP Professional x64 Edition, Red Hat Enterprise Linux Workstation 3 |
| | Supplied Software | | None |
| 16X/48X DVD-ROM Drive with +R Read Support | Height | | 5.25-in, half-height, tray load |
| | Interface Type | | ATAPI/EIDE |
| | Dimensions (W x H x D) | | 5.88 x 1.71 x 7.87 [max] in (149.5 x 43.25 x 200.0 [max] mm) (external, excluding bezel) |
| | Disc Formats | | DVD-ROM (single and dual layer); DVD-video; DVD-R version 1.0 and 2.0; DVD-RW version 1.0 and 1.1; DVD-R multi-border; DVD+RW; DVD+R ; CD-ROM Mode 1 and 2; CD-DA; CD-ROM XA Mode 2, Form 1 and 2; CD-extra; CD-text; CD-I Mode 2, Form 1 and 2; CD-I ready; video CD, CD-bridge; PhotoCD (single and multi-session); CD-R; CD-RW |
| | Disc Capacity | DVD-ROM | 4.7 GB (DVD-5), 8.54 GB (DVD-9), 9.4 GB (DVD-10), 3.95 GB (DVD-R version 1.0), 4.7 GB (DVD-R version 2.0), 4.7 GB (DVD-RW version 1.0 and 1.1), 4.7 GB (DVD+RW), 4.7G (DVD+R) |
| | | CD-ROM | 540 MB (Mode 1, 12 cm), 640 MB (Mode 2, 12 cm), 700 MB (80 minimum CD-R and CD-RW), 180 MB (8 cm) |
| | Access Times (typical reads, including settling) | DVD-ROM Single Layer | 120 ms |
| | | CD-ROM Mode 1 | 90 ms |
| | | Full Stroke DVD | 240 ms (seek) |
| | | Full Stroke CD | 160 ms (seek) |
| | | Startup Time | < 10 seconds (typical) |
| | | Stop Time | < 4 seconds |
| | | Data Transfer Modes | PIO Mode 4 (16.6 MB/s); Multi-word DMA mode 2 (16.6 MB/s); UltraDMA Mode 3 (44.4 MB/s) |
| | Maximum Data Transfer Rates | CD-ROM Read | 6000 KB/s (40X) Max |
| | | DVD-ROM Read | 21,600 KB/s (16X) Max |
| | | Digital Audio Extraction | 6000 KB/s (40X) Max |
| | Power | Source | Four-pin, DC power receptacle |
| | | DC Power Requirement | 5 VDC ± 5% – 100 mV ripple p-p |
| | | | 12 VDC ± 5% – 200 mV ripple p-p |
| | | DC Current | 5 VDC – <800 mA typical, < 1000 mA maximum |
| | | | 12 VDC – < 870 mA typical, <1800 mA maximum |
| | Audio Output | Line-Out | 0.7 VRMS |
| | | Signal-to-Noise Ratio | 85 dB |
| | | Channel Separation | 65 dB |
| | Configuration Jumper Block | | Master, slave, and cable select modes |
| | Data Interface Connector | | 40-pin, shrouded and keyed, flat ribbon |

*Technical Specifications - Optical Devices*

| | | | |
|---|---|---|---|
| | **Operating Environmental** (all conditions non-condensing) | **Temperature** (operating) | 41° to 122° F (5° to 50° C) |
| | | **Relative Humidity** (operating) | 10% to 85% |
| | | **Maximum Wet Bulb Temperature** (operating) | 86° F (30° C) |
| | **Certifications, Approvals** | MMC II support, multi-read certification, Microsoft WHQL certification, ACA AS/NZS 3548 class B, CNS 13438, C.I.S.P.R. Pub 22, TUV or VDE EN60950, EN 55022, EN55024, EMKO EN60950, EN 60825-1, UL 60950, CSA C22.2 60950-2000, CFR 21 part 1040 class 1, CFR 47 C.I.S.P.R. Pub 22 Class B, DHHS/FDA, ANSI C63.4-1992 | |
| | **Operating Systems Supported** | Windows 2000, XP Professional, and XP Professional x64 Edition<br>Red Hat Linux 7.2, 7.3 WS3 and WS4 Versions | |
| | **Kit Contents** | 16X/40X DVD-ROM Drive, InterVideo WinDVD MPEG Movie Playback software, audio cable, and installation guide. | |
| **HP 48X CD-RW** | **Form Factor** | 5.25-inch, half-height, tray-load | |
| | **Mounting Orientation** | Horizontal or vertical | |
| | **Interface** | ATAPI/EIDE | |
| | **Dimensions** (HxWxD) | 1.63 x 5.75 x 7.27 [max] in (4.13 x 14.6 x 18.5 [max] cm) (external, excluding bezel) | |
| | **Weight** (max) | 2.0 lb (0.9 kg) | |
| | **Read Only Disc Parameters** | **Data Transfer Rates - Read** | **Digital audio extraction** (minimum) - 1,800 KB/s (12X) |
| | | | **CD read** - up to 7,200 KB/s (48X) |
| | | **Media and Formats - Read** | **CD Media:** stamped; CD-R; CD-RW (LS, HS, US) |
| | | | **CD Capacities:** 180 MB (mode 2, 8 cm); 540 MB (mode 1, 12 cm); 650 MB (mode 2, 12 cm); 700 MB (Mode 2, 12 cm, 80-minute) |
| | | | **CD Formats:** CD-DA, CD-ROM (Mode 1 and 2), CD-XA (Mode 2, Form 1 and 2), Photo CD (Single and Multi-session), Mixed Mode (Audio and Data combined), CD-I (Mode 2, Form 1 and 2, and CD-I Ready), CD-Extra, CD-Bridge, Video CD |

| | | |
|---|---|---|
| Writeable Disc Parameters | Data Transfer Rates - Write | **CD-R write** - 2100 KB/s (14X) to 7200 KB/s (48X) |
| | | **CD-RW write** - 600 KB/s (4X) |
| | | **CD-RW write (high speed)** - 1500 KB/s (10X) to 1800 KB/s (12X) |
| | | **CD-RW write (ultra high speed)** - 2400 KB/s (16X) to 4800 KB/s (32X) |
| | Media and Formats - Write | **CD Media:** CD-R; CD-RW (LS, HS, US) |
| | | **CD Capacities:** 180 MB (mode 2, 8 cm); 540 MB (mode 1, 12 cm); 650 MB (mode 2, 12 cm); 700 MB (Mode 2, 12 cm, 80-minute) |
| | | **CD Formats:** CD-DA, CD-ROM (Mode 1 and 2), CD-XA (Mode 2, Form 1 and 2), Photo CD (Single and Multi-session), Mixed Mode (Audio and Data combined), CD-I (Mode 2, Form 1 and 2, and CD-I Ready), CD-Extra, CD-Bridge, Video CD |
| | Write Methods | Disc-at-once, session-at-once, track-at-once, incremental fixed and variable packet, multi-session |
| Access Times (typical reads, including settling) | CD-ROM Mode 1 | < 125 ms |
| | Full Stroke CD | < 210 ms |
| | Start-up Time (typical) | < 7 s (single session), < 30 s (multi-session) |
| | Stop Time (typical) | < 4 s |
| | Write Buffer Size | 2 MB |
| | Data Transfer Modes | PIO Mode 4 (16.6 MB/s); Multi-word DMA mode 2 (16.6 MB/s); UltraDMA Mode 2 (33.3 MB/s) |
| Power | Source | Four-pin, DC power receptacle |
| | DC Power Requirement | 5 VDC ± 5%-100 mV ripple p-p |
| | | 12 VDC ± 5%-200 mV ripple p-p |
| | DC Current | 5 VDC (< 1000 mA typical, < 1600 mA maximum) |
| | | 12 VDC (< 600 mA typical, < 1400 mA maximum) |
| | Total Drive Power (standby mode) | < 2.5 Watt |
| Audio Output | Line-Out | 0.7 VRMS |
| | Signal-to-Noise Ratio | 74 dB |
| | Channel Separation | 65 dB |
| Configuration Jumper Block | Master, slave, and cable select modes | |
| Operating Conditions | Temperature | 41° to 122° F (5° to 50° C) |
| | Humidity | 10% to 90%10% to 90% |

| | | |
|---|---|---|
| | **Certifications, Approvals** | MMC-3 support, multi-read compliant, Microsoft WHQL certification, ACA AS/NZS 3548 class B, BSMI CNS 13438, CE Mark, C.I.S.P.R. Pub 22, TUV or VDE EN60950, EN 55022, EN55024, EMKO EN60950, EN 60825-1, UL 60950, CSA C22.2 60950-2000, CFR 21 part 1040 class 1, CFR 47 C.I.S.P.R. Pub 22 Class B, DHHS/FDA, ANSI C63.4-1992 (FCC Class B) |
| | **Operating Systems Supported** | Microsoft Windows XP Professional, Microsoft Windows XP Professional x64 Edition, Red Hat Enterprise Linux Workstation 3 |
| | **Supplied Software** (for Windows XP) | Roxio Digital Media Plus: Create or copy CDs and DVDs, including music and data CDs, and data DVDs<br>Dantz Retrospect Express: Back up systems to CD, DVD, or tape media. |
| **48X Combo CD-RW/DVD-ROM** | **Form Factor** | 5.25-inch, half-height, tray-load |
| | **Mounting Orientation** | Horizontal or vertical |
| | **Interface** | ATAPI/EIDE |
| | **Dimensions** (HxWxD) | 5.77 x 1.71 x 7.87 [max] in (14.66 x 4.34 x 20.0 [max] cm) (external, excluding bezel) |
| | **Weight** (max) | 2.6 lb (1.2 kg) |
| | **Read Only Disc Parameters** | **Data Transfer Rates - Read**: **CD read** - 7200 KB/s (48X) Max<br>Digital audio extraction (minimum) - 1,800 KB/s (12X)<br>**DVD ROM read** - 21,632 KB/s (16X ) Max |
| | | **Media and Formats - Read**: **CD Media**: stamped; CD-R; CD-RW (LS, HS, US)<br>**CD Capacities:** 180 MB (mode 2, 8 cm); 540 MB (mode 1, 12 cm); 650 MB (mode 2, 12 cm); 700 MB (Mode 2, 12 cm, 80-minute)<br>**CD Formats:** CD-DA, CD-ROM (Mode 1 and 2), CD-XA (Mode 2, Form 1 and 2), Photo CD (Single and Multi-session), Mixed Mode (Audio and Data combined), CD-I (Mode 2, Form 1 and 2, and CD-I Ready), CD-Extra, CD-Bridge, Video CD<br>**DVD Media:** stamped (single and double layer); DVD+R; DVD+RW; DVD+R DL; DVD-R; DVD-RW<br>**DVD Capacities:** 4.7 GB (DVD-5), 8.54 GB (DVD-9), 9.4 GB (DVD-10), 3.95 GB (DVD-R version 1.0), 4.7 GB (DVD-R version 2.0), 4.7 GB (DVD-RW version 1.0 and 1.1), 4.7 GB (DVD+RW), 4.7G (DVD+R)<br>**DVD Formats:** DVD-ROM (single and dual layer); DVD-video; DVD-R version 1.0 and 2.0; DVD-RW version 1.0 and 1.1; DVD-R multi-border ; DVD+R version 1.2 (including multi-session); DVD+R DL version 1.0; DVD+RW version 1.2 |

*Technical Specifications - Optical Devices*

| | | |
|---|---|---|
| Writeable Disc Parameters | Data Transfer Rates - Write | **CD-R write** - 2100 KB/s (14X) to 7200 KB/s (48X) |
| | | **CD-RW write** - 600 KB/s (4X) |
| | | **CD-RW write** (high speed) - 1500 KB/s (10X) to 1800 KB/s (12X) |
| | | **CD-RW write** (ultra high speed) - 2400 KB/s (16X) to 4800 KB/s (32X) |
| | Media and Formats - Write | **CD Media:** CD-R; CD-RW (LS, HS, US) |
| | | **CD Capacities:** 180 MB (mode 2, 8 cm); 540 MB (mode 1, 12 cm); 650 MB (mode 2, 12 cm); 700 MB (Mode 2, 12 cm, 80-minute) |
| | | **CD Formats:** CD-DA, CD-ROM (Mode 1 and 2), CD-XA (Mode 2, Form 1 and 2), Photo CD (Single and Multi-session), Mixed Mode (Audio and Data combined), CD-I (Mode 2, Form 1 and 2, and CD-I Ready), CD-Extra, CD-Bridge, Video CD |
| | Write Methods | Disc-at-once, session-at-once, track-at-once, incremental fixed and variable packet, multi-session |
| Access Times (typical reads, including settling) | Random DVD | < 140 ms |
| | Random CD | < 125 ms, (typical) |
| | Full Stroke DVD | < 250 ms |
| | Full Stroke CD | < 210 ms |
| | Startup Time (single) | < 7 seconds (typical) |
| | Startup Time (multi-session) | < 30 seconds (typical) |
| | Stop Time (typical) | < 4 s |
| | Cache Buffer | 2 MB (minimum) |
| | Data Transfer Modes | ATA PIO mode 4 (16.7 MB/s); ATA Multi-word DMA mode 2 (16.7 MB/s); ATA UltraDMA Mode 3 (44 Mbytes/s) |
| Power | Source | Four-pin, DC power receptacle |
| | DC Power Requirement | 5 VDC ± 5%-100 mV ripple p-p |
| | | 12 VDC ± 5%-200 mV ripple p-p |
| | DC Current | 5 VDC (< 1000 mA typical, < 1600 mA maximum) |
| | | 12 VDC (< 600 mA typical, < 1400 mA maximum) |
| | Total Drive Power (standby mode) | < 2.5 Watt |
| Audio Output | Line-Out | 0.7 VRMS |
| | Signal-to-Noise Ratio | 74 dB |
| | Channel Separation | 65 dB |
| Configuration Jumper Block | Master, slave, and cable select modes | |
| Data Interface Connector | 40-pin, shrouded and keyed, flat ribbon | |

*Technical Specifications - Optical Devices*

| | | | |
|---|---|---|---|
| | **Operating Conditions** (all conditions non-condensing) | **Temperature** | 41° to 122° F (5° to 50° C) |
| | | **Relative humidity** | 10% to 90% |
| | | **Maximum wet bulb temperature** | 86° F (30° C) |
| | **Certifications, Approvals** | | MMC-3 support, multi-read compliant, Microsoft WHQL certification, ACA AS/NZS 3548 class B, BSMI CNS 13438, CE Mark, C.I.S.P.R. Pub 22, TUV or VDE EN60950, EN 55022, EN55024, EMKO EN60950, EN 60825-1, UL 60950, CSA C22.2 60950-2000, CFR 21 part 1040 class 1, CFR 47 C.I.S.P.R. Pub 22 Class B, DHHS/FDA, ANSI C63.4-1992 (FCC Class B) |
| | **Operating Systems Supported** | | Microsoft Windows XP Professional, Microsoft Windows XP Professional x64 Edition, Red Hat WS3 and WS4 Versions |
| | **Supplied Software** (for Windows XP) | | Roxio Cineplayer Movie Playback<br>Roxio Digital Media Plus: Create or copy CDs and DVDs, including music and data CDs, and data DVDs<br>Dantz Retrospect Express: Back up systems to CD, DVD, or tape media. |
| **16X DVD+/-RW, Dual-Layer** (Win and RHWS3) | **Height** | | 5.25-inch, half-height, tray-load |
| | **Orientation** | | Either horizontal or vertical |
| | **Interface Type** | | ATAPI/EIDE |
| | **Disc Recording Capacity** | | 4.7 GB (single-layer), 8.5 GB (double-layer) |
| | **Dimensions** (W x H x D) | | 5.9 x 1.7 x 7.9 in (15.0 x 4.4 x 20.0 cm) |
| | **Weight** (maximum) | | 2.6 lb (1.2 kg) |
| | **Recording Method** | | Disc-at-once, Track-at-once, and Session-at-once; Variable Packet and Fixed Packet |
| | **Write Support** | | DVD+R (1.3), DVD+R DL (1.0), DVD+RW (1.2), DVD-R (2.0), DVD-RW (1.1), CD-R (OBII Vol2.0 Rev 1.2), CD-RW (LS, HS, US) |
| | **Read Support** | | DVD-ROM (single- and dual-layer), DVD-Video, DVD+R (include multisession), DVD+RW, DVD-R (incl. multiborder), DVD-RW, DVD-MRW; CD-ROM Mode 1, CD-ROM XA (Mode 2, forms 1 and 2), CD-TEXT, Photo CD single- and multi-session), CD-DA (Audio CD), CD-Extra, CD-R, CD-RW (supports AM2), VCD, CD-I, UDF (1.02 and 1.50), CD-MRW |
| | **Write Speed** (maximum) | **DVD+R** | 16X CAV (21,600 KB/s), 8x ZCLV (10,800 KB/s), 2.4-8x CLV (3250-10,800 KB/s) |
| | | **DVD+RW** | 2.4-4X CLV (3250-5400 KB/s) |
| | | **DVD-R** | 2-4X CLV (2700-5400 KB/s), 8X ZCLV (10,800 KB/s) |
| | | **DVD-RW** | 2-4X CLV (2700-5400 KB/s) |
| | | **CD-R** | 16-40X CAV (2400-6000 KB/s) |
| | | **CD-RW** (US) | 4-24X CLV (600-3600 KB/s) |
| | **Read Speed** (maximum) | **DVD-ROM** | 5-16X CAV (6750 - 21,600 KB/s) |
| | | **DVD+R, DVD+RW, DVD-R, DVD-RW** | 4-8X CAV (5400 - 10,800 KB/s) |
| | | **CD-ROM, CD-R, CD-RW, CD-Audio** | 16-40X CAV (2400 to 6000 KB/s) |
| | **Access Time** (typical reads, including settling) | **Random DVD** | < 130 ms (typical) |
| | | **Random CD** | < 120 ms, (typical) |
| | | **Full Stroke DVD** | < 240 ms (seek) |

| | | |
|---|---|---|
| | **Full Stroke CD** | < 200 ms (seek) |
| | **Startup Time** (single) | < 7 seconds (typical) |
| | **Startup Time** (multi-session) | < 30 seconds (typical) |
| | **Stop Timex** | < 4 seconds |
| | **Cache Buffer** | 2 MB (minimum) |
| | **Data Transfer Modes** | ATA PIO mode 4 (16.7 MB/s); ATA Multi-word DMA mode 2 (16.7 MB/s); ATA UltraDMA Mode 3 (44.4 MB/s) (default on most HP xw workstations) |
| **Power** | **Source** | Four-pin, DC power receptacle |
| | **DC Power Requirement** | 5 VDC ± 5%-100 mV ripple p-p |
| | | 12 VDC ± 10%-200 mV ripple p-p |
| | **DC Current** | 5 VDC (< 2000 mA typical, < 2500 mA maximum) |
| | | 12 VDC (< 700 mA typical, < 2000 mA maximum) |
| | **Total Drive Power** (standby mode) | < 2.5 Watt |
| **Audio Output** | **Line-Out** | 0.7 VRMS |
| | **Signal-to-Noise Ratio** | 74 dB |
| | **Channel Separation** | 65 dB |
| **Operating Environmental** (all conditions non-condensing) | **Temperature** | 41° to 122° F (5° to 50° C) |
| | **Relative humidity** | 10% to 90% |
| | **Maximum wet bulb temperature** | 86° F (30° C) |
| **System Configuration** | Intel Pentium IV Processor or later with 128 MB of memory (required); 256 MB recommended 2-D or 3-D graphics cards on primary disk drive for operating system and application software; second disk drive for audio and video data | |
| **Operating Systems Support** | Windows 2000, XP Professional, and XP Professional x64 Edition<br>Red Hat Linux 7.2, 7.3 WS3 and WS4 Versions (Red Hat Linux 7.2, 7.3, 8, 9.0 may require additional third party software to make full use of this device) | |
| **Regulatory Approvals** | MPC-3 and MMC-4 compliant, multi-read certified, ATA Spec X3T9.2, ATAPI Spec T13.1153D, ANSI C63.4-1992, UL 60950, ACA AS/NZS 3548, CB Bulletin No. 96A, CSA C22.2 No. 60950, CFR 47 C.I.S.P.R. Pub 22 Class B, DHHS/FDA, EMKO-TSE 07/94, TUV EN60950, EN60825-1, MIC Class B, BSMI-CNS 13438, CE EN60950, EN55022:1998 and EN55024, Microsoft Logo for Windows XP, relevant parts of IEC 61000-4. | |
| **Option Kit contents** | 16X DVD±R/±RW Drive, InterVideo WinDVD, InterVideo WinDVD Creator, Roxio Easy Media Creator, Dantz Retrospect Express Backup Software, installation guide, and DVD+R media.<br>NOTE: This DVD writer kit does not include any software for burning DVDs on Linux. DVD burning is supported with the 'growisofs' command. CD burning is supported with the 'cdrecord' command. Red Hat Enterprise Linux WS 3 distribution includes both 'cdrecord' and 'growisofs'. Red Hat Linux 7.2, 7.3, 8, 9.0 distributions only include 'cdrecord'. Therefore DVD burning is only supported on WS 3. | |

*Technical Specifications - Optical Devices*

| | | | |
|---|---|---|---|
| 16X DVD+/-RW, Dual-Layer, with LightScribe Direct Disc Labeling | Form Factor | 5.25-inch, half-height, tray-load | |
| | Orientation | Horizontal or vertical | |
| | Interface | ATAPI/EIDE | |
| | Dimensions (HxWxD) | 5.9 x 1.7 x 7.9 in (15.0 x 4.4 x 20.0 cm) | |
| | Weight (maximum) | 2.6 lb (1.2 kg) | |
| | Read Only Disc Parameters | Data Transfer Rates - Read | DVD-ROM, DVD-video read - 5-16X (6750 - 21,600 KB/s CAV) |
| | | | DVD-video playback, DVD+R, DVD+RW, DVD-R, DVD-RW - 4-8X (5400 - 10,800 KB/s CAV) |
| | | | CD-audio playback - 8x (1200 KB/s CLV) |
| | | | Digital audio extraction (minimum) - 12X (1,800 KB/s CAV) |
| | | | CD-ROM, CD-R, CD-RW, CD-Audio read - 16-40X (2400 to 6000 KB/s CAV) |
| | | Media and Formats - Read | CD Media: stamped; CD-R; CD-RW (supports AM2) (LS, HS, US) |
| | | | CD Capacities: 180 MB (mode 2, 8 cm); 540 MB (mode 1, 12 cm); 650 MB (mode 2, 12 cm); 700 MB (Mode 2, 12 cm, 80-minute) |
| | | | CD Formats: CD-DA, CD-ROM (Mode 1 and 2), CD-XA (Mode 2, Form 1 and 2), Photo CD (Single and Multi-session), Mixed Mode (Audio and Data combined), CD-I (Mode 2, Form 1 and 2, and CD-I Ready), CD-Extra, CD-Bridge, Video CD, UDF (1.02 and 1.50) |
| | | | DVD Media: stamped (single and double layer); DVD+R; DVD+RW; DVD+R DL; DVD-R; DVD-RW |
| | | | DVD Capacities: 4.7 GB (DVD-5), 8.54 GB (DVD-9), 9.4 GB (DVD-10), 14.1 GB (DVD-14), 17.0 GB (DVD-18), 3.95 GB (DVD-R version 1.0), 4.7 GB (DVD-R version 2.0), 4.7 GB (DVD-RW version 1.0 and 1.1), 4.7 GB (DVD+RW), 4.7G (DVD+R), 1.46 GB (DVD+R, 8cm), 1.46 GB (DVD+RW, 8cm) |
| | | | DVD Formats: DVD-ROM (single and dual layer); DVD-video; DVD-R version 1.0 and 2.0 (including multi-border); DVD-RW version 1.0 and 1.1; DVD+R version 1.3 (including multi-session); DVD+R DL version 1.0; DVD+RW version 1.2 |

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|---|---|---|
| Writeable Disc Parameters | Data Transfer Rates - Write | **CD-R write** - 16-40X (2400-6000 KB/s CAV) |
| | | **CD-RW write** - 4X (600 KB/s CLV) |
| | | **CD-RW write** (high speed) - 10X (1500 KB/s CLV) |
| | | **CD-RW write** (ultra high speed) - 16-24X (2400-3600 KB/s ZCLV) |
| | | **DVD+R** - 6-16X (8100-21,600 KB/s CAV), 8x (10,800 KB/s ZCLV), 2.4-4x (3250-5400 KB/s CLV) |
| | | **DVD+R DL** - 2.4 (3250 KB/s CLV) |
| | | **DVD+RW** - 2.4-4X (3250-5400 KB/s CLV) |
| | | **DVD-R** - 2-4X (2700-5400 KB/s CLV), 8X (10,800 KB/s ZCLV) |
| | | **DVD-RW** - 2-4X (2700-5400 KB/s CLV) |
| | Media and Formats - Write | **CD Media:** CD-R (OBII Vol2.0 Rev 1.2), CD-RW (LS, HS, US) |
| | | **CD Capacities:** 180 MB (mode 1, 8 cm); 540 MB (mode 1, 12 cm); 650 MB (mode 2, 12 cm); 700 MB (Mode 2, 12 cm, 80-minute) |
| | | **CD Formats:** CD-DA, CD-ROM (Mode 1 and 2), CD-XA (Mode 2, Form 1 and 2), Photo CD (Single and Multi-session), Mixed Mode (Audio and Data combined), CD-I (Mode 2, Form 1 and 2, and CD-I Ready), CD-Extra, CD-Bridge, Video CD, UDF (1.02 and 1.50) |
| | | **DVD Media:** DVD+R, DVD+R DL, DVD+RW, DVD-R, DVD-RW |
| | | **DVD Capacities:** 4.7 GB (DVD-5), 8.54 GB (DVD-9), 4.7 GB (DVD-R version 2.0), 4.7 GB (DVD-RW version 1.1), 4.7 GB (DVD+RW version 1.3), 4.7G (DVD+R version 1.2) ), 1.46 GB (DVD+R, 8cm), 1.46 GB (DVD+RW, 8cm) |
| | | **DVD Formats**: DVD-R version 1.0 and 2.0 (including multi-border); DVD-RW version 1.0 and 1.1; DVD+R version 1.3 (including multi-session); DVD+R DL version 1.0; DVD+RW version 1.2 |
| | Write Methods | Disc-at-once, session-at-once, track-at-once, incremental fixed and variable packet, multi-session |
| LightScribe Direct Disc Labeling Parameters | Media Supported | **CD-R:** LightScribe Version 1.0 |
| | | **DVD+R:** LightScribe Version 1.0 |
| | Resolution | **Dots per inch:** 600 |
| | | **Tracks per inch:** 500-1600 (mode dependent) |
| | Labeling Times | **Draft quality:** < 20 min |
| | | **Normal quality:** < 28 min |
| | | **Best quality:** < 36 min |

*Technical Specifications - Optical Devices*

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|---|---|---|
| Access Times (typical reads, including settling) | Random DVD | < 130 ms (typical) |
| | Random CD | < 120 ms (typical) |
| | Full Stroke DVD | < 240 ms |
| | Full Stroke CD | < 200 ms |
| | Startup Time (single) | < 7 seconds (typical) |
| | Startup Time (multi-session) | < 30 seconds (typical) |
| | Stop Time (typical) | < 4 s |
| | Cache Buffer | 2 MB |
| | Data Transfer Modes | ATA PIO mode 4 (16.7 MB/s); ATA Multi-word DMA mode 2 (16.7 MB/s); ATA UltraDMA Mode 3 (44.4 MB/s) (default on most HP xw series workstations) |
| Power | Source | Four-pin, DC power receptacle |
| | DC Power Requirement | 5 VDC ± 5%-100 mV ripple p-p |
| | | 12 VDC ± 5%-200 mV ripple p-p |
| | DC Current | 5 VDC (< 1000 mA typical, < 1600 mA maximum) |
| | | 12 VDC (< 600 mA typical, < 1400 mA maximum) |
| | Total Drive Power (standby mode) | < 2.5 Watt |
| Audio Output | Line-Out | 0.7 VRMS |
| | Signal-to-Noise Ratio | 74 dB |
| | Channel Separation | 65 dB |
| Operating Conditions (all conditions non-condensing) | Temperature | 41° to 122° F (5° to 50° C) |
| | Relative humidity | 10% to 90% |
| | Maximum wet bulb temperature | 86° F (30° C) |
| Certifications, Approvals | MMC-4 compliant, multi-read compliant, Microsoft WHQL certification, ACA AS/NZS 3548 class B, BSMI CNS 13438, CE Mark, C.I.S.P.R. Pub 22, TUV or VDE EN60950, EN 55022, EN55024, EMKO EN60950, EN 60825-1, UL 60950, CSA C22.2 60950-2000, CFR 21 part 1040 class 1, CFR 47 C.I.S.P.R. Pub 22 Class B, DHHS/FDA, ANSI C63.4-1992 (FCC Class B), relevant parts of IEC 61000-4. | |
| Operating Systems Supported | Microsoft Windows XP Professional,<br>Microsoft Windows XP Professional x64 Edition<br>Red Hat Linux 7.3 WS3 and WS4 Versions (LightScribe labeling functionality not supported on Linux) | |

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|---|---|
| **Supplied Software** (for Windows XP) | Roxio Cineplayer Movie Playback<br>Roxio Digital Media Plus: Create or copy CDs and DVDs, including music and data CDs, and data DVDs<br>Roxio MyDVD for DVD authoring<br>Dantz Retrospect Express: Back up systems to CD, DVD, or tape media<br>NOTE: LightScribe Direct Disc Labeling is supported only on 32-bit Windows XP in the launch timeframe for the xw4300. Support for Windows XP Professional x64 Edition is anticipated to be available some time after the launch, and will require software updates. There is no support for LightScribe labeling under Linux. The drive will operate as a DVD writer under these other operating systems, but will not be available in software applications as a LightScribe "printer". |

NOTE: This DVD writer kit does not include any software for burning DVDs on Linux. DVD burning is supported with the 'growisofs' command. CD burning is supported with the 'cdrecord' command. Red Hat Enterprise Linux WS 3 distribution includes both 'cdrecord' and 'growisofs'. Red Hat Linux 8, 9.0 distributions only include 'cdrecord'. Therefore DVD burning is only supported on WS 3.

| | | |
|---|---|---|
| NVIDIA Quadro NVS 280 (PCI) | Form Factor | ATX |
| | Graphic Controller | Integrated Quadro 280 2-D graphics processor unit (GPU) |
| | VGA controller | Integrated into the Quadro GPU |
| | Bus type | PCI |
| | RAMDAC | Dual 350 MHz |
| | Memory | 64 MB DDR with frame buffer and Texture storage |
| | Connector | Single High-density Flex Connector |
| | Dimensions | Low-profile, 2.586 x 6.6 in (6.57 x 16.76 cm) |
| | Controller clock speed | 275 MHz |
| | Color planes | 32-bit color buffer |
| | Overlay planes | 1 16-bit Video overlay plane |
| | Maximum vertical refresh rate | 120 Hz |
| | Maximum pixel clock | 350 MHz |
| | Multi-monitor support | Dual analog or digital monitors |
| | Single DVI Support | Yes |
| | Dual DVI Support | Yes |
| | High-definition Video Processor (HDVP) | Full-screen, full-frame video playback of HDTV and DVD content<br>DVD-ready motion compensation for MPEG-2<br>Independent hardware color controls for video overlay<br>Hardware color-space conversion (YUV 4:2:2 and 4:2:0)<br>IDCT motion compensation<br>5-tap horizontal by 3-tap vertical filtering<br>8:1 up/down scaling |
| | Available graphics drivers | Microsoft Windows 2000 and Microsoft Windows XP (Provides full native Dual View mode, Span or Big Desktop mode, and Clone mode)<br>Red Hat Linux<br>HP qualified drivers may be preloaded or available from the HP support web site: http://welcome.hp.com/country/us/eng/software_drivers.html. |
| | Maximum resolution | 2048 x 1536 Analog<br>1600 x 1200 Digital |

*Technical Specifications - Graphics*

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|---|---|---|---|
| **NVIDIA Quadro NVS 280 Graphics Card** (PCI-Express) | **Form Factor** | ATX | |
| | **Graphics Controller** | Integrated Quadro 280 2-D graphics processor unit (GPU) | |
| | **VGA controller** | Integrated into the Quadro GPU | |
| | **Bus Type** | PCI-Express x16 or PCI | |
| | **RAMDAC** | Dual 350 MHz integrated | |
| | **Memory** | 64 MB 000 MHz DDR SDRAM unified frame buffer, Z-buffer and Texture storage | |
| | **Connectors** | Single High-density Flex Connector | |
| | **Multi-monitor support** | Dual integrated analog display controllers supporting up to two analog displays at 1920 x1200 @ 85Hz or two digital displays at 1600x1200 @ 60Hz | |
| | **Additional product features** | **Controller clock speed** | 250 MHz |
| | | **Color planes** | 32-bit color buffer |
| | | **Overlay planes** | 1 16-bit Video overlay plane |
| | | **Maximum vertical refresh rate** | 120 Hz |
| | | **Maximum pixel clock** | 350 MHz |
| | | **Single DVI Support** | Yes |
| | | **Dual DVI Support** | Yes |
| | | **High-definition Video Processor** (HDVP) | Full-screen, full-frame video playback of HDTV and DVD content |
| | | | DVD-ready motion compensation for MPEG-2 |
| | | | Independent hardware color controls for video overlay |
| | | | Hardware color-space conversion (YUV 4:2:2 and 4:2:0) |
| | | | IDCT motion compensation |
| | | | 5-tap horizontal by 3-tap vertical filtering |
| | | | 8:1 up/down scaling |
| | **PCI-Express** | Supports X16 PCI-E | |
| | **Available graphics drivers** | Microsoft Windows® XP or Windows 2000 (Provides full native Dual View mode, Span or Big Desktop mode, and Clone mode) | |
| | | HP qualified drivers may be preloaded or available from the HP support Web site: http://welcome.hp.com/country/us/eng/software_drivers.html. | |
| | **Maximum resolution** | 2048 x 1536 Analog | |
| | | 1600 x 1200 Digital | |

*Technical Specifications - Graphics*

| | | |
|---|---|---|
| **ATI FireGL V3100 Graphics Card** (PCI Express) | **Form factor** | ATX |
| | **Graphics controller** | RV370 |
| | **Bus type** | PCI-Express x16 |
| | **Memory** | 128MB 200MHz DDR unified frame buffer, Z-buffer and Texture storage |
| | **Connectors** | 1 DVI-I analog/digital and 1 VGA analog monitor output |
| | **Multi-monitor support** | Dual integrated display controllers supporting up to 2048x1536 @ 85Hz on both displays |
| | **RAMDAC** | Dual 400 MHz integrated |
| | **Architecture features** | 128-bit memory interface<br>128-bit IEEE floating-point precision<br>24-bits per RGBA color precision<br>4-bit sub-pixel precision<br>2 parallel geometry engines<br>4 parallel pixel pipelines<br>2x/4x/6x FSAA<br>Hardware accelerated antialiased points and lines<br>Hardware OpenGL overlay planes<br>Hardware accelerated two-sided lighting<br>Hardware accelerated clipping planes<br>Hardware accelerated occlusion culling<br>Hardware accelerated clip planes |
| | **Shading architecture** | Smartshader™ technology<br>Programmable pixel and vertex shaders<br>16 textures per pass<br>Pixel shaders up to 160 instructinos with 32-bit floating point precision for each RGBA component<br>Multiple render target support<br>Shadow volume rendering acceleration<br>High precision 10-bit per channel frame buffer support |
| | **Supported graphics APIs** | OpenGL 1.5<br>DirectX 9.0 |
| | **Available graphics drivers** | Windows XP Professional, Windows XP Professional x64 Edition, Linux Xfree86HP qualified drivers may be preloaded or available from the HP support Web site: http://welcome.hp.com/country/us/eng/software_drivers.html. |
| | **Maximum resolution** | DVI-I output – drives digital display at resolutions up to 1600x1200<br>Internal 400MHz RAMDACs – drives dual analog displays up to 2048x1536 @ 85Hz each |

*Technical Specifications - Graphics*

| | | |
|---|---|---|
| NVIDIA Quadro FX 540 PCI-Express Graphics Card | Form Factor | ATX, 4.376" x 7.0"<br>Single slot |
| | Graphics Controller | NVIDIA NV43GL |
| | Bus Type | PCI-Express x16, <75W power consumption |
| | RAMDAC | Dual 400 MHz integrated |
| | Memory | 128 MB 275 MHz DDR SDRAM unified frame buffer, Z-buffer and Texture storage<br>8.8 GB/sec graphics memory bandwidth |
| | Connectors | DVI-I + VGA + 10-pin HDTV Out (HD cable purchased separately) |
| | Multi-monitor support | Dual integrated analog display controllers supporting up to two analog displays at 2048x1536 @ 75Hz, one digital display at 1600x1200 @ 60Hz. |
| | Additional product features | 128 KB BIOS 3.3V Flash ROM reprogrammable by SW<br>Hardware accelerated Overlay Planes<br>Hardware accelerated two-sided lighting<br>Hardware accelerated antialiased points and lines<br>3D Volumetric Texture support<br>Hardware accelerated Occlusion Culling<br>Compliant with Microsoft/Intel PC2001 Workstation requirements<br>Video Timings compliant with VESA DMT 1.0 and VESA GTF 1.0 specifications<br>DDC2B+ Monitor support on all OS platforms<br>ACPI Version 1.0b Power Management support (all modes) |
| | Shading architecture | Fully programmable GPU (OpenGL1.5/DirectX 9.0c class)<br>Long fragment programs (up to 65,536 instructions)<br>Long vertex programs (up to 65,536 instructions)<br>Looping and subroutines (up to 256 loops per vertex program)<br>Dynamic flow control<br>Conditional execution<br>Optimized compilers for Cg, OpenGL shading language, and Microsoft HLSL |
| | Supported graphics APIs | OpenGL 1.5 ICD with immediate mode support for all OGL primitive types<br>DirectX 9.0c |
| | Available graphics drivers | HP-tested: Microsoft Windows XP, Windows 2000, and Linux<br>HP qualified drivers may be preloaded or available from the HP support Web site:<br>http://welcome.hp.com/country/us/eng/software_drivers.html. |
| | Maximum Resolution | DVI-I output - drives digital display at resolutions up to 1600x1200 @ 60Hz<br>Internal 400MHz RAMDACs - drives dual analog displays up to 2048x1536 @ 75Hz each |

*Technical Specifications - Graphics*

| | | |
|---|---|---|
| NVIDIA Quadro FX 1400 PCI-Express Graphics Controller | Form Factor | ATX, 4.376" x 8.5"<br>Single slot |
| | Graphics Controller | NVIDIA NV41GL |
| | Bus Type | PCI-Express x16, <75W power consumption |
| | RAMDAC | Dual 400 MHz integrated |
| | Memory | 128 MB 300 MHz DDR SDRAM unified frame buffer, Z-buffer and Texture storage<br>19.2 GB/s graphics memory bandwidth |
| | Connectors | 2 DVI-I analog/digital monitor outputs, 1 3-pin Mini DIN stereo output |
| | Multi-monitor support | Dual integrated analog display controllers supporting up to two analog displays at 2048x1536 @ 85Hz on both displays. |
| | Additional product features | 128 KB BIOS 3.3V Flash ROM reprogrammable by SW<br>Hardware accelerated Overlay Planes<br>Hardware accelerated two-sided lighting<br>Hardware accelerated antialiased points and lines<br>Quad-buffered Stereo<br>3D Volumetric Texture support<br>Hardware accelerated Occlusion Culling<br>Scalable Link Interface (SLI) technology<br>Compliant with Microsoft/Intel PC2001 Workstation requirements<br>Video Timings compliant with VESA DMT 1.0 and VESA GTF 1.0 specifications<br>DDC2B+ Monitor support on all OS platforms<br>ACPI Version 1.0b Power Management support (all modes) |
| | Shading architecture | Fully programmable GPU (OpenGL1.5/DirectX 9.0c class)<br>Long fragment programs (up to 65,536 instructions)<br>Long vertex programs (up to 65,536 instructions)<br>Looping and subroutines (up to 256 loops per vertex program)<br>Dynamic flow control<br>Conditional execution<br>Optimized compilers for Cg, OpenGL shading language, and Microsoft HLSL |
| | Supported graphics APIs | OpenGL 1.5 ICD with immediate mode support for all OGL primitive types<br>DirectX 9.0c |
| | Available graphics drivers | HP-tested: Microsoft Windows XP, Windows 2000 and Linux<br>HP qualified drivers may be preloaded or available from the HP support Web site:<br>http://welcome.hp.com/country/us/eng/software_drivers.html. |
| | Maximum Resolution | Dual DVI-I output – drives dual digital displays at resolutions up to 1900x1200 @ 60Hz<br>Internal 400MHz RAMDACs – drives dual analog displays up to 2048x1536 @ 85Hz each |

*Technical Specifications - Graphics*

**ATI FireGL V5100 PCI-Express Graphics Controller**

| | |
|---|---|
| Form Factor | ATX |
| Graphics Controller | RV423 |
| Bus Type | PCI-Express x16 |
| Memory | 128 MB 350MHz DDR unified frame buffer, Z-buffer and Texture storage |
| Connectors | 2 DVI-I analog/digital monitor outputs, 1 3-pin Mini DIN stereo output |
| Multi-monitor support | Dual integrated display controllers supporting up to two analog displays at 2048x1536 @ 85Hz on both displays. |
| RAMDAC | Dual 400 MHz integrated |
| Architecture features | 256-bit memory interface<br>128-bit IEEE floating-point precision<br>24-bits per RGBA color precision<br>8-bit sub-pixel precision<br>6 parallel geometry engines<br>12 parallel pixel pipelines<br>2x/4x/6x FSAA<br>Hardware accelerated antialiased points and lines<br>Hardware OpenGL overlay planes<br>Hardware accelerated two-sided lighting<br>Hardware accelerated clipping planes<br>Hardware accelerated occlusion culling<br>Hardware accelerated clip planes<br>Quad-buffered stereo |
| Shading architecture | Smartshader™ technology<br>Programmable pixel and vertex shaders<br>16 textures per pass<br>Pixel shaders up to 160 instructions with 32-bit floating point precision for each RGBA component<br>Multiple render target support<br>Shadow volume rendering acceleration<br>High precision 10-bit per channel frame buffer support |
| Supported graphics APIs | OpenGL 1.5<br>DirectX 9.0 |
| Available graphics drivers | HP-tested: Microsoft Windows XP, Windows 2000, and Linux<br>HP qualified drivers may be preloaded or available from the HP support Web site: http://welcome.hp.com/country/us/eng/software_drivers.html. |
| Maximum Resolution | DVI-I output – drives digital displays at resolutions up to 1600x1200<br>Internal 400MHz RAMDAC – drives dual analog displays up to 2048x1536 @ 85Hz each |

*Technical Specifications - Graphics*

| | | |
|---|---|---|
| NVIDIA Quadro FX 3400 Graphics Card | Form Factor | ATX |
| | Graphics Controller | NVIDIA NV45GL |
| | Bus Type | PCI-Express x16 |
| | Memory | 256 MB 450 MHz GDDR3 SDRAM unified frame buffer, Z-buffer and Texture storage |
| | Connectors | 2 DVI-I (one dual-link/one single-link) analog/digital monitor outputs,<br>1 3-pin Mini DIN stereo output |
| | Multi-monitor support | Dual integrated analog display controllers supporting up to two analog displays at 2048x1536 @ 85Hz on both displays or dual digital displays at 1600x1200 (single-link) and 3840x2400 (dual-link).<br>NVIEW advanced multi-display desktop and application management seamlessly integrated into Microsoft Windows |
| | RAMDAC | Dual 400 MHz integrated |
| | Architecture features | 256-bit memory interface<br>128-bit IEEE floating-point precision graphics pipeline<br>128-bit color precision<br>12-bit sub-pixel precision<br>8x FSAA at 1920x1200, 4x at 2048x1536, rotated grid FSAA sampling algorithm<br>Hardware accelerated antialiased points and lines<br>Hardware OpenGL overlay planes<br>Hardware accelerated two-sided lighting<br>Hardware accelerated clipping planes<br>3rd generation occlusion culling<br>3D volumetric texture support<br>Quad-buffered stereo<br>Dual Link DVI enabling driving digital displays up to 3840x2400 (24Hz) |
| | Shading architecture | Fully programmable GPU<br>Long fragment programs (up to 65,536 instructions)<br>Long vertex programs (up to 65,536 instructions)<br>Looping and subroutines (up to 256 loops per vertex program)<br>Dynamic flow control<br>Conditional execution |
| | Supported graphics APIs | OpenGL 1.5<br>DirectX 9.0 |
| | Available graphics drivers | HP-tested: Microsoft Windows XP, Windows 2000, and Linux<br>HP qualified drivers may be preloaded or available from the HP support Web site: http://welcome.hp.com/country/us/eng/software_drivers.html. |
| | Maximum Resolution | Dual DVI-I output – drives dual digital displays at resolutions up to 1600x1200 @ 60Hz (single-link) and 3840x2400 @ 24Hz (dual-link).<br>Internal 400MHz RAMDACs – drives dual analog displays up to 2048x1536 @ 75Hz each |

| | | |
|---|---|---|
| NVIDIA Quadro FX 3450 Graphics Controller | Form Factor | ATX |
| | Graphics Controller | NVIDIA Quadro FX 3450 Workstation GPU |
| | Bus Type | PCI-Express x16 |
| | Memory | 256 MB 450 MHz GDDR3 SDRAM unified graphics memory |
| | Connectors | 2 DVI-I (one dual-link/one single-link) analog/digital monitor outputs, 1 3-pin Mini DIN stereo output, DVI-I to VGA adapters included |

| | |
|---|---|
| Multi-Monitor Support | Dual integrated display controllers supporting up to two analog displays at 2048 x 1536 @ 75 Hz on both displays or dual digital displays at 1920 x 1200 (single-link) and 3840 x 2400 (dual-link).<br>NVIEW advanced multi-display desktop and application management seamlessly integrated into Microsoft Windows |
| Architecture Features | 256-bit memory interface<br>128-bit IEEE floating-point color precision<br>12-bit sub-pixel precision<br>65,536 fragment instruction<br>65,536 vertex instruction<br>3D volumetric textures<br>Single-system powerwall<br>12 pixels per clock rendering engine<br>Hardware accelerated antialiased points and lines<br>Hardware OpenGL overlay planes<br>Hardware accelerated two-sided lighting<br>Hardware accelerated clipping planes<br>3rd generation occlusion culling<br>16 textures per pixel in fragment programs<br>Window ID clipping functionality<br>Hardware accelerated line stippling<br>OpenGL Quad-buffered stereo |
| Shading Architecture | Fully programmable GPU (OpenGL 2.0/DirectX 9.0c class)<br>Long fragment programs (up to 65,536 instructions)<br>Long vertex programs (up to 65,536 instructions)<br>Looping and subroutines (up to 256 loops per vertex program)<br>Dynamic flow control<br>Conditional execution |
| High Level Shader Languages | Optimized compiler for Cg and Microsoft® HLSL<br>OpenGL 2.0 and DirectX 9.0c support<br>Open source compiler |
| High-Resolution Antialiasing | 12-bit subpixel sampling precision enhances AA quality<br>Rotated-grid full-scene antialiasing (RG FSAA)<br>8x FSAA dramatically reduces visual aliasing artifacts or "jaggies" at resolution up to 1920x1200 |
| Display Resolution Support | Dual Link DVI- I output-drives digital displays at resolutions up to 3840 x 2400 @ 24 Hz<br>Single Link DVI-I output drives digital displays at resolutions up to 1920 x 1200 @ 75 Hz<br>Internal 400 MHz DACs - Two analog displays up to 2048 x 1536 @ 75 Hz each |
| nView Architecture | Advanced multi-display desktop & application management seamlessly integrated into Microsoft Windows. |
| Supported Graphics APIs | OpenGL 2.0 ICD with immediate mode support for all OGL primitive types<br>DirectX 9.0c |
| Available Graphics Drivers | Microsoft Windows XP, Linux - Full Open GL implementation, complete with NVIDIA and ARB extensions.<br>HP qualified drivers may be preloaded or available from the HP support web site:<br>http://welcome.hp.com/country/us/eng/software_drivers.html. |

| | | |
|---|---|---|
| NVIDIA Quadro FX 4500 Graphics Controller | Graphics Controller | NVIDIA Quadro FX 4500 Workstation GPU |
| | Bus Type | PCI Express x16 |
| | RAMDAC | Dual 400 MHz integrated |
| | Memory | 512 MB GDDR3 SDRAM unified graphics memory |
| | Form Factor | ATX |
| | Connectors | 2 DVI-I analog/digital monitor outputs, 1 3-pin Mini DIN stereo output, DVI-I to VGA adapters indluded |
| | Multi-Monitor Support | Dual integrated display controllers supporting up to 2048 x 1536 @ 75 Hz (analog) or 3840 x 2400 @ 41 Hz (digital) on both displays |
| | NVIDIA Quadro FX 4500 Architecture | 256-bit memory interface<br>35.2GB/sec. memory bandwidth<br>Full 128-bit floating point color precision<br>12-bit subpixel precision<br>65,536 fragment instruction<br>65,536 vertex instruction<br>3D volumetric textures<br>Single-system powerwall<br>12 pixels per clock rendering engine<br>Hardware accelerated antialiased points & lines<br>Hardware OpenGL® overlay planes<br>Hardware accelerated two-sided lighting<br>Hardware accelerated clipping planes<br>Hardware two-sided lighting<br>3rd-generation occlusion culling<br>OpenGL quad-buffered stereo<br>Hardware-Accelerated Pixel Read-Back |
| | Shading Architecture | 16 textures per pixel in fragment programs<br>Window ID clipping functionality<br>Hardware accelerated line stippling<br>Fully programmable GPU (OpenGL2.0/DirectX 9.0c class)<br>Long fragment programs (up to 65,536 instructions)<br>Long vertex programs (up to 65,536 instructions)<br>Looping and subroutines (up to 256 loops per vertex program)<br>Dynamic flow control<br>Conditional execution |
| | High Level Shader Languages | Optimized compiler for Cg and Microsoft HLSL<br>OpenGL 2.0 and DirectX 9.0c support<br>Open source compiler |
| | High-Resolution Antialiasing | 12-bit subpixel sampling precision enhances AA quality<br>Rotated-grid full-scene antialiasing (RG FSAA)<br>16x FSAA dramatically reduces visual aliasing artifacts or "jaggies" at resolution up to 1920x1200 |
| | Display Resolution Support | Dual Dual Link DVI- I output-drives digital displays at resolutions up to 3840 x 2400 @ 41 Hz<br>Internal 400 MHz DACs - Two analog displays up to 2048 x 1536 @ 75 Hz each |
| | nView Architecture | Advanced multi-display desktop & application management seamlessly integrated into Microsoft Windows. |

| | |
|---|---|
| Supported Graphics APIs | OpenGL 2.0 ICD with immediate mode support for all OGL primitive types<br>DirectX 9.0c |
| Available Graphics drivers | Microsoft Windows XP, Linux - Full Open GL implementation, complete with NVIDIA and ARB extensions.<br>HP qualified drivers may be preloaded or available from the HP support web site:<br>http://welcome.hp.com/country/us/eng/software_drivers.html |

| | | | |
|---|---|---|---|
| HP L1755 Flat Panel Monitor | Panel | Type | Active matrix, thin film transistor (TFT) |
| | | Viewable Image Area (diagonal) | 17 in (43.2 cm) maximum viewable |
| | | Screen Opening (WxH) | 13.4 x 10.7 in (33.9 x 27.2 cm) |
| | | Viewing Angle (typical) | 176 degrees horizontal/176 degrees vertical (10:1 minimum contrast ratio) |
| | | Brightness (typical) | Up to 250 nits ($cd/m^2$) |
| | | Contrast Ratio (typical) | Up to 1000:1 (typical) |
| | | Response Rate (typical) | 25 ms (typical rise + fall) |
| | | Pixel Pitch | 0.264 mm |
| | | Color Depth Support | 16.7 million colors |
| | Video/Other Inputs | Plug and Play | Yes (supports VESA DDC2B; PC2001 compliant) |
| | | Self Powered USB 2.0 Hub | One upstream, four downstream ports (cable included) |
| | | Input Signal | Two connectors: one 15-pin mini D-sub analog VGA; and one DVI-I (VGA analog or digital) |
| | | Input Impedance | 75 ohms ± 2% |
| | | Sync Input | Separate sync (HSYNC/VSYNC); composite sync, Sync on Green (activated through on-screen display) |
| | | Video Cable | VGA to VGA, DVI-D to DVI-D, and DVI-I to VGA |
| | | Video Cable Length | 78 in (2.0 m) |
| | Signal Interface/ Performance | Horizontal Frequency | 30 to 82 kHz |
| | | Vertical Frequency | 56 to 75 Hz |
| | | Native Resolution | 1280 x 1024 @ 60 Hz analog |
| | | | 1280 x 1024 @ 60 Hz digital |
| | | Maximum Resolution (Analog) | 1280 x 1024 @ 75 Hz analog |
| | | Maximum Resolution (Digital) | 1280 x 1024 @ 75 Hz digital |
| | | Preset VESA Graphic Modes (non-interlaced) | 640 x 480 @ 60 Hz, 72 Hz, 75 Hz<br>720 x 400 @ 70 Hz |
| | | | 800 x 600 @ 60 Hz, 72 Hz, 75 Hz |
| | | | 1024 x 768 @ 60 Hz, 70 Hz, 75 Hz |
| | | | 1280 x 1024 @ 60 Hz, 75 Hz |
| | | Preset MAC Mode | 832 x 624 @ 75 Hz |
| | | | 1152 x 870 @75 Hz |
| | | Preset VGA Mode | 640 x 480 @ 60 Hz, 72 Hz |
| | | Preset SUN Mode | 1152 x 900 @ 76 Hz |
| | | Fail Safe Mode | Yes (limits out of range signal messages) |
| | | Maximum Pixel Clock Speed | 140 MHz |
| | | User Programmable Modes | Yes, 15 |
| | | Anti-Glare | Yes |

| | | | |
|---|---|---|---|
| | Anti-Static | | Yes |
| | AssetControl | | Yes (accessible on HP Compaq Business Desktops featuring Intelligent Manageability) |
| | Default Color Temperature | | Yes (6500k, 9300k, SRGB, Custom User) |
| On Screen Display (OSD) Controls | Buttons or Switches | | Power on/off; 3-button OSD; second level OSD buttons include dual-input switch, dedicated auto adjust switch |
| | Languages | | English, Spanish, French, German, Italian, Japanese, Simplified Chinese |
| | User Controls | | Size and positioning, contrast, brightness, clock, clock phase, selectable color temperature, serial number, mode displayed, sleep timer, input selection, factory reset, individual color contrast, full-screen resolution |
| Power | Power Supply | | Auto-ranging, 90 to 265 VAC; internal power supply |
| | Input Power | | 100 ~ 240 VAC |
| | Nominal Current | | 1.5 A maximum |
| | Frequency | | 50 ~ 60 Hz |
| | Average | | 33 watts when displaying standard office software |
| | Typical Power Consumption | | < 40 watts |
| | Maximum | | < 60 watts |
| | Power Saving | | < 2 W |
| | Off Mode | | 0 watts (when master power switch is in the off position) |
| | Power Cable Length | | 70 in (1.8 m); non-captive |
| Mechanical | Dimensions (H x W x D) | Unpacked with stand | 16.1 (minimum) to 21.2 (maximum) x 14.4 x 8.3 in (40.9 (minimum) to 42.2 (maximum) x 36.5 x 21.1 cm) |
| | | Base Area (Footprint D x W) | 8.3 x 12.2 in (21.1 x 30.9 cm) |
| | | Panel only (without stand) (H x W x D) | 11.8 x 14.4 x 2.9 in (30.1 x 40.9 x 7.3 cm) |
| | Weight | Unpacked with stand | 14.7 lb (6.7 kg) |
| | | Unpacked without stand | 8.1 lb (3.7 kg) |
| | | Packaged | 20.2 lb (9.2 kg) |
| | Bezel Width | | 13 mm left and right, 14 mm top, and 15 mm bottom |
| | Tilt Range | | -5° to +35° |
| | Swivel Range | | ± 50° horizontal swivel |
| | Height Adjustable | | Yes (5.1 in/13 cm adjustment range) |

| | | |
|---|---|---|
| | Pivot Rotation | Yes, 90 ° |
| | Base | Ships detached and is removable after installation |
| Environmental | Temperature – Operating | 41° to 95° F (5° to 35° C) |
| | Temperature – Non-operating | -4° to 140° F (-20° to 60° C) |
| | Humidity – Operating | 20% to 80% |
| | Humidity – Non-operating | 5% to 95% |
| | Altitude – Operating | 0 to 13,000 ft (0 to 4,000 m) |
| | Altitude – Non-operating | 0 to 40,000 ft (0 to 12,192 m) |
| Options | HP Desktop Access Center – Part number: DK985A | Features integrated microphone/headset jacks, dual function headset for phone/PC support, a MultiBay slot for adding an optical drive (sold separately), and four USB ports for easy integration of third-party digital solutions. Sold separately. For more information, refer to the HP Desktop Access Center QuickSpec document. |
| | HP Flat Panel Speaker Bar – Part number: PF804AA | Powered directly by the monitor, seamlessly attaches to the monitor's bezel to bring full multimedia support to select HP flat panel monitors. Features dual speakers with full sound range and external jack for headphones. Sold separately. For more information, refer to the HP Flat Panel Speaker Bar QuickSpec document. |
| | HP Compaq 7000 Series Ultra-slim Desktop Integrated Work Center Stand – Part number: DL641B | Allows mounting of a 15-, 17- or 19-inch HP flat panel monitor and an HP Compaq dc7100 Ultra-slim Desktop PC on a single stand for the convenience of an "all-in-one" form factor. Sold separately. For more information, refer to this product's QuickSpec document |
| Other | Accessories Included | VGA to VGA cable, DVI-D to DVI-D cable, DVI-I to VGA cable, USB cable, user CD-ROM with Pivot Pro software |
| | Software | Pivot Pro software from Portrait Displays, Inc. interacts with your PC's native graphics driver to enable seamless portrait screen redraws with a simple mouse-click or keyboard command. Pivot Pro supports 90-degree portrait and landscape views. Language support is available in English, Japanese, French, German, Spanish, Italian, and Traditional and Simplified Chinese. |
| | Software | HP Display LiteSaver feature lets you schedule Sleep mode at preset times to help protect the display against image retention, drastically lower power consumption and energy costs, and extend the lifespan of the monitor. |

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|---|---|---|---|
| | | **User Guide Languages** | English, Latin America Spanish, Brazilian Portuguese, Danish, Dutch, Finnish, French, German, Italian, Norwegian, Swedish, Greek, Polish, Russian, Slovenian, Turkish, Simplified Chinese, Traditional Chinese, Korean, and Japanese |
| | | **Warranty Languages** | English, Canadian French, Latin America Spanish, Brazilian Portuguese, Danish, Dutch, Finnish, French, German, Italian, Norwegian, Spanish, Swedish, Bahasa Indonesian, Simplified Chinese, Traditional Chinese, and Korean |
| | | **Color** | Carbonite, two-tone carbonite and silver (EMEA only) |
| | | **VESA Mounting** | Yes (swing arm/wall mount not included); base must be removed for mounting options) |
| | | **VESA External Mounting** | Yes (standard 4 hole pattern, 100 mm) |
| | | **Kensington Lock-ready** | Yes |
| | **Certification and Compliance** | Australian ACA Approval, Canadian Requirements/CSA, CE Marking, China CCC Approval, CISPR Requirements, Eastern European Approvals, Energy Star Compliant, FCC Approval, German Ergonomic (TUV and GS Mark), ISO 13406-2 Compliant (Pixel Defect Guidelines), Mexican NOM Approval, MPR-II Compliant, PC2001 Compliant, PC99 Certified, S. Korean MIC Approval, Taiwan BSMI Approval, TCO 99 or 03 depending on region (emissions, ergonomics, environment), TUV-Ergo, UL Listed, VCCI Approvals, Microsoft Windows Certification | |
| | **Compatibility** | VESA Video Signal Standard (VSIS) Compliant video cards have been tested and proven compatible for use with the HP L1755 Flat Panel Monitor. Recommended for use with HP products. | |
| | **Service and Warranty** | Limited three-year parts and repair labor, service provider labor, and on-site service. Next business day advanced exchange direct replacement service available during warranty period. Certain restrictions and exclusions apply. For details, contact HP Customer Support. | |
| **HP L1955 Flat Panel Monitor** | **Panel** | **Type** | Active matrix, thin film transistor (TFT) |
| | | **Viewable Image Area** (diagonal) | 19 in (48.25 cm) maximum viewable |
| | | **Screen Opening** (WxH) | 14.9 x 12.0 in (38.0 x 30.5 cm) |
| | | **Viewing Angle** (typical) | 176 degrees horizontal/176 degrees vertical (10:1 minimum contrast ratio) |
| | | **Brightness** (typical) | Up to 250 nits ($cd/m^2$) |
| | | **Contrast Ratio** (typical) | Up to 1000:1 (typical) |
| | | **Response Rate** (typical) | <16 ms (typical rise + fall) |
| | | **Pixel Pitch** | 0.294 mm |
| | | **Color Depth Support** | 16.7 million colors |

| | | |
|---|---|---|
| Video/Other Inputs | Plug and Play | Yes (supports VESA DDC2B; PC2001 compliant) |
| | Self Powered USB 2.0 Hub | One upstream, four downstream ports (cable included) |
| | Input Signal | Two connectors: one 15-pin mini D-sub analog VGA; and one DVI-I (VGA analog or digital) |
| | Input Impedance | 75 ohms ± 2% |
| | Sync Input | Separate sync (HSYNC/VSYNC); composite sync, Sync on Green (activated through on-screen display) |
| | Video Cable | VGA to VGA, DVI-D to DVI-D, and DVI-I to VGA |
| | Video Cable Length | 78 in (2.0 m) |
| Signal Interface/ Performance | Horizontal Frequency | 30 to 82 kHz |
| | Vertical Frequency | 56 to 75 Hz |
| | Native Resolution | 1280 x 1024 @ 75 Hz analog |
| | | 1280 x 1024 @ 60 Hz digital |
| | Maximum Resolution (Analog) | 1280 x 1024 @ 75 Hz analog |
| | Maximum Resolution (Digital) | 1280 x 1024 @ 75 Hz digital |
| | Preset VESA Graphic Modes (non-interlaced) | 640 x 480 @ 60 Hz, 72 Hz, 75 Hz<br>720 x 400 @ 70 Hz |
| | | 800 x 600 @ 60 Hz, 72 Hz, 75 Hz |
| | | 1024 x 768 @ 60 Hz, 70 Hz, 75 Hz |
| | | 1280 x 1024 @ 60 Hz, 75 Hz |
| | Preset MAC Mode | 832 x 624 @ 75 Hz |
| | | 1152 x 870 @75 Hz |
| | Preset VGA Mode | 640 x 480 @ 60 Hz, 72 Hz |
| | Preset SUN Mode | 1152 x 900 @ 76 Hz |
| | Fail Safe Mode | Yes (limits out of range signal messages) |
| | Maximum Pixel Clock Speed | 140 MHz |
| | User Programmable Modes | Yes, 15 |
| | Anti-Glare | Yes |
| | Anti-Static | Yes |
| | AssetControl | Yes (accessible on HP Compaq Business Desktops featuring Intelligent Manageability) |
| | Default Color Temperature | Yes (6500k, 9300k, SRGB, Custom User) |
| On Screen Display (OSD) Controls | Buttons or Switches | Power on/off; 3-button OSD; second level OSD buttons include dual-input switch, dedicated auto adjust switch |
| | Languages | English, Spanish, French, German, Italian, Japanese, Simplified Chinese |
| | User Controls | Size and Positioning |
| | | Contrast |

| | | | |
|---|---|---|---|
| | | Brightness | |
| | | Clock, Clock Phase | |
| | | Selectable Color Temperature | |
| | | Serial Number | |
| | | Mode Displayed | |
| | | Sleep Timer | |
| | | Input Selection | |
| | | Factory Reset | |
| | | Individual Color Contrast | |
| | | Full-screen Resolution | |
| Power | Power Supply | Auto-ranging, 90 to 265 VAC; internal power supply | |
| | Input Power | 100 ~ 240 VAC | |
| | Nominal Current | 1.5 A maximum | |
| | Frequency | 50 ~ 60 Hz | |
| | Average | 33 watts when displaying standard office software | |
| | Typical Power Consumption | < 40 watts | |
| | Maximum | < 60 watts | |
| | Power Saving | < 2 watts | |
| | Off Mode | 0 watts (when master power switch is in the off position) | |
| | Power Cable Length | 70 in (1.8 m); non-captive | |
| Mechanical | Dimensions (H x W x D) | Unpacked with stand | 16.8 (minimum) to 22.3 (maximum) x 15.9 x 8.3 in (42.7 (minimum) to 56.6 (maximum) x 40.4 x 21.1 cm) |
| | | Base Area (Footprint D x W) | 8.3 x 12.2 in (21.1 x 30.9 cm) |
| | | Panel only (without stand) (H x W x D) | 13.2 x 15.9 x 3.1 in (33.5 x 40.4 x 7.9 cm) |
| | Weight | Unpacked with stand | 16.5 lb (7.5 kg) |
| | | Unpacked without stand | 10.5 lb (4.75 kg) |
| | | Packaged | 23.5 lb (10.7 kg) |
| | Bezel Width | 13 mm left and right, 14 mm top, and 15 mm bottom | |
| | Tilt Range | -5° to +35° | |
| | Swivel Range | ± 50° horizontal swivel | |
| | Height Adjustable | Yes (5.1 in/13 cm adjustment range) | |
| | Pivot Rotation | Yes, 90 ° | |
| | Base | Ships detached and is removable after installation | |

| | | |
|---|---|---|
| Environmental | Temperature – Operating | 41° to 95° F (5° to 35° C) |
| | Temperature – Non-operating | -4° to 140° F (-20° to 60° C) |
| | Humidity – Operating | 20% to 80% |
| | Humidity – Non-operating | 5% to 95% |
| | Altitude – Operating | 0 to 13,000 ft (0 to 4,000 m) |
| | Altitude – Non-operating | 0 to 40,000 ft (0 to 12,192 m) |
| Options | Desktop Access Center | Features integrated microphone/headset jacks, dual function headset for phone/PC support, a MultiBay slot for adding an optical drive (sold separately), and four USB ports for easy integration of third-party digital solutions. Sold separately; part number DK985A. For more information, refer to the HP Desktop Access Center QuickSpecs. |
| | HP Flat Panel Speaker Bar | Powered directly by the monitor, seamlessly attaches to the monitor's bezel to bring full multimedia support to select HP flat panel monitors. Features dual speakers with full sound range and external jack for headphones. Sold separately, part number PF804AA. For more information, refer to the HP Flat Panel Speaker Bar QuickSpecs. |
| Other | Accessories Included | VGA to VGA cable, DVI-D to DVI-D cable, DVI-I to VGA cable, USB cable, user CD-ROM with Pivot Pro software |
| | Software | Pivot Pro software from Portrait Displays, Inc. interacts with your PC's native graphics driver to enable seamless portrait screen redraws with a simple mouse-click or keyboard command. Pivot Pro supports 90-degree portrait and landscape views. Language support is available in English, Japanese, French, German, Spanish, Italian, and Traditional and Simplified Chinese. |
| | Software | HP Display LiteSaver feature lets you schedule Sleep mode at preset times to help protect the display against image retention, drastically lower power consumption and energy costs, and extend the lifespan of the monitor. |
| | User Guide Languages | English |
| | Warranty Languages | English |
| | Color | Carbonite, two-tone carbonite and silver (EMEA only) |
| | VESA Mounting | Yes (swing arm/wall mount not included); base must be removed for mounting options) |
| | VESA External Mounting | Yes (standard 4 hole pattern, 100 mm) |
| | Kensington Lock-ready | Yes |

| | | |
|---|---|---|
| | Certification and Compliance | Australian ACA Approval, Canadian Requirements/CSA, CE Marking, China CCIB/CCEE Approval, CISPR Requirements, Eastern European Approvals, Energy Star Compliant, FCC Approval, German Ergonomic (TUV and GS Mark), ISO 13406-2 Compliant (Pixel Defect Guidelines), Mexican NOM Approval, MPR-II Compliant, PC2001 Compliant, PC99 Certified, S. Korean MIC Approval, Taiwan BSMI Approval, TCO 99 or 03 depending on region (emissions, ergonomics, environment), TUV-Ergo, UL Listed, VCCI Approvals, Microsoft® Windows® Certification |
| | Compatibility | VESA Video Signal Standard (VSIS) Compliant video cards have been tested and proven compatible for use with the HP L1955 Flat Panel Monitor. Recommended for use with HP products. |
| | Service and Warranty | Limited three-year parts and repair labor, service provider labor, and on-site service. Next Business Day advanced exchange direct replacement service available during warranty period. Certain restrictions and exclusions apply. For details, contact HP Customer Support. |

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|---|---|---|---|
| HP Flat Panel Monitor L2035 | Panel | Type | 20-inch Active Matrix TFT (thin film transistor) |
| | | Viewable Image Area (diagonal) | 20.1 in (51 cm) |
| | | Screen Opening (W x H) | 16.2 x 12.17 in (41.1 x 30.9 cm) |
| | | Viewing Angle (typical)* | Up to 170° H/170° V (10:1 minimum contrast ratio) |
| | | Brightness (typical* | Up to 250 nits (cd/$m^2$) |
| | | Contrast Ratio (typical)* | Up to 400:1 |
| | | Response Rate (typical)* | 16 ms (typical, rise + fall) |
| | | Pixel Pitch | 0.255 mm |
| | | Color Depth Support | 16.7 million colors |
| | | *All specifications are provided by the component manufacturers. Performance specifications represent the highest specification of all HP's component manufacturers' typical level specifications for performance. Actual performance may vary either higher or lower. | |
| | On Screen Display (OSD) Controls | Buttons or Switches | PiP (Picture in Picture), Input select, auto adjust, OSD up, OSD down, OSD menu select, power |
| | | Languages | English, French, German, Spanish, Italian |
| | | User Controls | Brightness, contrast, positioning, color temperature, individual color control, serial number display, full screen resolutions, clock, clock phase, video picture-in-picture (size and position), input selection (includes separate direct access key for dedicated swap between inputs 1 and 2), factory reset |

| | | |
|---|---|---|
| Signal Interface/ Performance | Horizontal Frequency | 30 to 94 kHz (VGA input); 30 to 92 KHz (DVI input) (for modes with pixel clock less than 157 MHz) |
| | Vertical Frequency | 48 to 85 Hz (VGA input); 30 to 92 KHz (DVI input) (for modes with pixel clock less than 157 MHz) |
| | Graphics Controller | Pixelworks PW171 |
| | Native Resolution | 1600 x 1200 @ 60 Hz (recommended) |
| | Preset VESA Graphic Modes (non-interlaced) | 1600 x 1200 @ 60 Hz, 75 Hz (VGA input)<br>1280 x 1024 @ 60 Hz, 75 Hz, 85 Hz<br>1280 x 960 @ 60 Hz<br>1152 x 900 @ 66 Hz<br>1024 x 768 @ 60 Hz, 75 Hz, 85 Hz<br>800 x 600 @ 60 Hz, 85 Hz<br>640 x 480 @ 60 Hz, 75 Hz, 85 Hz |
| | Text Mode | 720 x 400 @ 70 Hz |
| | Mac Mode | 1152 x 870 @ 75 Hz and 832 x 624 @ 75 Hz |
| | Sun Mode | 1152 x 900 @ 66 Hz |
| | Maximum Pixel Clock Speed | 202 MHz (VGA input); 162 MHz (DVI input) |
| | User Programmable Modes | Yes, 10 |
| | Anti-Glare | Yes |
| | Anti-Static | Yes |
| | Default Color Temperature | 6500 K |
| Video Input | Plug and Play | Yes |
| | Input Signal | Four connectors, including one 15-pin mini D-sub VGA, one DVI-I (VGA analog and digital input), one composite video, and one s-video |
| | Input Impedance | 75 ohms ± 10% |
| | Sync Input | Separate sync (HSYNC/VSYNC); composite sync, Sync on Green |
| | Video Cable | VGA to VGA; VGA to DVI-I; DVI-D to DVI-I |
| | Video Cable Length | 5.9 ft (1.8 m) |
| Power | Input Power | Auto-Ranging, 90 to 132 VAC and 195 to 265 VAC; internal power supply, 50 Hz/60 Hz |
| | Frequency | 47.5 to 63 Hz |
| | Maximum | < 75 W |
| | Power Saving | < 5 W |
| | Power Cable Length | 5.9 ft (1.8 m) |

*Technical Specifications - Monitors*

| | | | |
|---|---|---|---|
| Mechanical | Dimensions (H x W x D) | Unpacked with stand | 17.36 to 20.9 x 17.8 x 8.27 in (44.1 to 53.1 x 45.2 x 21.0 cm) |
| | | Unpacked without stand (head only) | 14.29 x 17.8 x 3.19 in (36.3 x 45.2 x 8.1 cm) |
| | | Packaged | 11.5 x 21.9 x 23.9 in (29.2 x 55.6 x 60.6 cm) |
| | Weight | Unpacked | With stand: 20.28 lb (9.2 kg); Without stand: 12.35 lb (5.6 kg) |
| | | Packaged | 26.9 lb (12.2 kg) |
| | Tilt Range | -5° to + 25° vertical | |
| | Swivel Range | -35° to + 35° | |
| | Height Adjustable | Yes, range 3.54 in (9.0 cm) | |
| | Pivot Rotation | Yes | |
| | Base | Attached | |
| Environmental | Temperature – Operating | 46° to 95° F (10° to 35° C) | |
| | Temperature – Non-operating | 6° to 140° F (-10° to 60° C) | |
| | Humidity – Operating | 20% to 80% non-condensing | |
| | Humidity – Non-operating | 5% to 85% | |
| | Altitude – Operating | +12,000 ft (+3,657.6 m) | |
| | Altitude – Non-operating | +40,000 ft (+12,192 m) | |
| Options | HP Desktop Access Center | Sold separately, the HP Desktop Access Center features integrated microphone/headset jacks, dual function headset for phone/PC support, a MultiBay slot for adding an optical drive (sold separately), and four USB ports for easy integration of third-party digital solutions; part number DK985A. For more information, refer to the HP Desktop Access Center QuickSpecs. | |

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| | Other | Accessories Included | VGA to VGA cable – connects the graphic card's VGA analog connector to the monitor's input #1 (VGA analog) connector<br>VGA to DVI-I cable – connects the graphic card's VGA connector to the monitor's input #2 (DVI-I analog) connector<br>DVI-D to DVI-I cable – connects the graphic card's DVI-D digital connector to the monitor's input #2 (DVI-I digital) connector |
| | | User Guide Languages | English, B. Portuguese, French, LA Spanish, Korean, S. Chinese, T. Chinese, Bahasa, Japanese, Danish, Finnish, German, Norwegian, Spanish, Swedish, Greek, Polish, Russian, Slovenian, Turkish |
| | | Warranty Languages | English, Canadian French, LA Spanish, Brazilian Portuguese, Danish, German, Castilian Spanish, French, Italian, Dutch, Norwegian, Finnish, Swedish, Bahasa Indonesian, Korean, T. Chinese, S. Chinese |
| | | Color | Carbonite/Silver |
| | | VESA External Mounting | Yes (Standard 4 hole pattern, 100 mm) |
| | | Kensington Lock-Ready | Yes |
| | Certification and Compliance | Australian ACA Approval, Canadian Requirements/CSA, CE Marking, China CCIB/CCEE Approval, CISPR Requirements, Eastern European Approvals, *Energy Star Compliant, FCC Approval, German Ergonomic (TUV and GS Mark), ISO 9241-3,7,8 VDT Guidelines, ISO 13406-2 Pixel Defect Guidelines, Mexican NOM Approval, MIC Requirements (New Zealand), MPR-II Compliant, Nordic Approvals (Nemko, Fimko, Demko, Semko), PC2001 Compliant, PC99 Certified, S. Korean MIC Approval, Taiwan BSMI Approval, TCO 03 (emissions, ergonomics, environment), TUV-Ergo, UL Listed, VCCI Approvals, Windows Certification (Microsoft® Windows® 98, Microsoft Windows 2000, and Microsoft Windows XP)<br>* Energy Star Compliant available summer 2004. | |
| | Service and Warranty | Limited three years parts, labor, and on-site service, including backlight. Availability varies by region. Certain restrictions and exclusions apply. Consult HP Customer Service for details. | |
| HP Flat Panel Monitor L2335 | Panel | Type | 23-inch Active Matrix TFT (thin film transistor) |
| | | Viewable Image Area (diagonal) | 23 in (58.4 cm) |
| | | Screen Opening (W x H) | 19.53 x 12.24 in (49.6 x 31.1 cm) |
| | | Viewing Angle (typical)* | Up to 170° H/170° V (10:1 minimum contrast ratio) |
| | | Brightness (typical)* | Up to 250 nits (cd/$m^2$) |
| | | Contrast Ratio (typical)* | Up to 500:1 |
| | | Response Rate (typical)* | 16 ms (typical, rise + fall) |
| | | Pixel Pitch | 0.258 mm |
| | | Color Depth Support | 16.7 million colors |

* All specifications are provided by the component manufacturers. Performance specifications represent the highest specification of all HP's component manufacturers' typical level specifications for performance. Actual performance may vary either higher or lower.

| | | |
|---|---|---|
| On Screen Display (OSD) Controls | Buttons or Switches | PiP (Picture in Picture), Input Select, Auto Adjust, OSD Up, OSD Down, OSD Menu Select, Power |
| | Languages | English, French, German, Spanish, Italian |
| | User Controls | Brightness, contrast, positioning, color temperature, individual color control, serial number display, full screen resolutions, clock, clock phase, video picture-in-picture (size and position), input selection (includes separate direct access key for dedicated swap between inputs 1 and 2), factory reset |
| Signal Interface/ Performance | Horizontal Frequency | 30 to 94 kHz (VGA input); 30 to 92 KHz (DVI input) (for modes with pixel clock less than 157 MHz) |
| | Vertical Frequency | 48 to 85 Hz (VGA and DVI input) |
| | Graphics Controller | Pixelworks PW172 |
| | Native Resolution | 1920 x 1200 @ 60 Hz (recommended) |
| | Preset VESA Graphic Modes (non-interlaced) | 1920 x 1200 @ 60Hz<br>1600 x 1200 @ 60 Hz, 75 Hz<br>1280 x 1024 @ 60 Hz, 75Hz, 85 Hz<br>1280 x 960 @ 60 Hz<br>1152 x 900 @ 66 Hz<br>1024 x 768 @ 60 Hz, 75 Hz, 85 Hz<br>800 x 600 @ 60 Hz, 75Hz<br>640 x 480 @ 60 Hz, 75 Hz |
| | Text Mode | 720 x 400 @ 70 Hz |
| | Mac Mode | 1152 x 870 @ 75 Hz and 832 x 624 @ 75 Hz |
| | Sun Mode | 1152 x 900 @ 66 Hz |
| | Maximum Pixel Clock Speed | 202 MHz (VGA input); 162 MHz (DVI input) |
| | User Programmable Modes | Yes, 10 |
| | Anti-Glare | Yes |
| | Anti-Static | Yes |
| | Default Color Temperature | 6500 K |
| Video Input | Plug and Play | Yes |
| | Input Signal | Five connectors, including one 15-pin mini D-sub VGA, one DVI-I (VGA analog and digital input), one composite video, one s-video, component video |
| | Input Impedance | 75 ohms ± 10% |
| | Sync Input | Separate sync (HSYNC/VSYNC); composite sync, Sync on Green |

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|---|---|---|---|
| | Video Cable | VGA to VGA; VGA to DVI-I; DVI-D to DVI-I | |
| | Video Cable Length | 5.9 ft (1.8 m) | |
| Power | Input Power | Auto-Ranging, 90 to 132 VAC and 195 to 265 VAC; internal power supply, 50 Hz/60 Hz | |
| | Frequency | 47.5 to 63 Hz | |
| | Maximum | < 100 W | |
| | Power Saving | < 5 W | |
| | Power Cable Length | 5.9 ft (1.8 m) | |
| Mechanical | Dimensions (H x W x D) | Unpacked | 17.36 (min) to 20.9 (max) x 21.46 x 8.27 in (44.1 (min) to 53.1 (max) x 54.5 x 21.0 cm) |
| | | Unpacked withou stand (head only) | 14.57 x 21.46 x 3.35 in (37.0 x 54.5 x 8.5 cm) |
| | | Packaged | 11.5 x 25.75 x 23.86 in (29. 2 x 65.4 x 60.6 cm) |
| | Weight | Unpacked | 22.27 lb (10.1 kg) |
| | | Packaged | 30.87 lb (14.0 kg) |
| | Tilt Range | -5° to + 25° vertical | |
| | Swivel Range | -35° to + 35° | |
| | Height Adjustable | Yes, range 3.54 in (9.0 cm) | |
| | Pivot Rotation | Yes | |
| | Base | Attached | |
| Environmental | Temperature – Operating | 46° to 95° F (10° to 35° C) | |
| | Temperature – Non-operating | 6° to 140° F (-10° to 60° C) | |
| | Humidity – Operating | 20% to 80% non-condensing | |
| | Humidity – Non-operating | 5% to 85% | |
| | Altitude – Operating | +12,000 ft (+3,657.6 m) | |
| | Altitude – Non-operating | +40,000 ft (+12,192 m) | |
| Options | HP Desktop Access Center | Sold separately, the HP Desktop Access Center Features integrated microphone/headset jacks, dual function headset for phone/PC support, a MultiBay slot for adding an optical drive (sold separately), and four USB ports for easy integration of third-party digital solutions; part number DK985A. For more information, refer to the HP Desktop Access Center QuickSpecs. | |

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| Other | Accessories Included | VGA to VGA cable – connects the graphic card's VGA analog connector to the monitor's input #1 (VGA analog) connector<br>VGA to DVI-I cable – connects the graphic card's VGA connector to the monitor's input #2 (DVI-I analog) connector<br>DVI-D to DVI-I cable – connects the graphic card's DVI-D digital connector to the monitor's input #2 (DVI-I digital) connector |
| | User Guide Languages | English, B. Portuguese, French, LA Spanish, Korean, S. Chinese, T. Chinese, Bahasa, Japanese, Danish, Finnish, German, Norwegian, Spanish, Swedish, Greek, Polish, Russian, Slovenian, Turkish |
| | Warranty Languages | English, Canadian French, LA Spanish, Brazilian Portuguese, Danish, German, Castilian Spanish, French, Italian, Dutch, Norwegian, Finnish, Swedish, Bahasa Indonesian, Korean, T. Chinese, S. Chinese |
| | Color | Carbonite/silver |
| | VESA External Mounting | Yes (Standard 4 hole pattern, 100 mm) |
| | Kensington Lock-Ready | Yes |
| Certification and Compliance | | Australian ACA Approval, Canadian Requirements/CSA, CE Marking, China CCIB/CCEE Approval, CISPR Requirements, Eastern European Approvals, *Energy Star Compliant, FCC Approval, German Ergonomic (TUV and GS Mark), ISO 9241-3,7,8 VDT Guidelines, ISO 13406-2 Pixel Defect Guidelines, Mexican NOM Approval, MIC Requirements (New Zealand), MPR-II Compliant, Nordic Approvals (Nemko, Fimko, Demko, Semko), PC2001 Compliant, PC99 Certified, S. Korean MIC Approval, Taiwan BSMI Approval, TCO 03 (emissions, ergonomics, environment), TUV-Ergo, UL Listed, VCCI Approvals, Windows Certification (Microsoft® Windows® 98, Microsoft Windows 2000, and Microsoft Windows XP).<br>* Energy Star Compliant available summer 2004. |
| Service and Warranty | | Limited three years parts, labor, and on-site service, including backlight. Availability varies by region. Certain restrictions and exclusions apply. Consult HP Customer Service for details. |